Project Final Report

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Submission Date: 30 November 2024

Telemedicine Platform for Remote Areas

DECLEARATION OF PROJECT

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Title of Project	**:**	Telemedicine Platform for Remote Areas
Academic Session	**:**	2024

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Certified by:

_____

SIGNATURE OF SUPERVISOR

NAME OF SUPERVISOR: MS. Tapushe Rabaya Toma

Date:

AKNOWLEDGEMENT

we want to thanks Daffodil International University for giving us a great chance to hence ourself and also developing this project, thirdly we want to appreciate our department of software engineering especially our honorable head **Dr. Imran Mahmud** and our dear teachers for excellence teaching and providing such incredible study.

This project is called Telemedicine Platform for Remote Areas and it's about Remote and underserved areas often face challenges in accessing quality healthcare services due to limited medical facilities, shortage of healthcare professionals, and poor infrastructure. These challenges result in delayed diagnoses, untreated illnesses, and a higher rate of preventable deaths. We are very proud and happy to make this project and remark one of our dreams done

Finally, we want appreciate our dear teacher **Ms. Tapushe Rabaya Toma** for her excellence teaching and advices during our study of her course as well as our project.

Thanks

Arup Das Apu
Mahinur Rahman Nifad
MD. Mosharuf Hossen

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CHAPTER 1 INTRODUCTION

1.1 Project Scenario

The goal of this project is to develop a comprehensive telemedicine platform aimed at providing accessible and efficient healthcare services to people in remote and rural areas. This platform will leverage technology to bridge the gap between healthcare providers (doctors) and patients who have limited access to medical facilities.

1.2 Project Feasibility Study (Step-by-Step)

Phase 1 Market Feasibility Analysis (or Market Research):

Market research is essential to understand the demand for telemedicine services in rural areas, identify target users, and evaluate the competition.

Market research is also known as organizational feasibility. This means we need to ensure that our service will be usable by the general public. We need to launch the service in a way that our target audience will feel comfortable using it. At first, we have to analyze:

- **Healthcare Needs:** Rural areas often have limited access to healthcare services, with long distances to medical facilities, a shortage of healthcare providers, and higher incidences of chronic diseases.
- **Target Users:** The primary users would be patients in rural areas seeking medical consultations and doctors willing to provide remote services.
- **Existing Solutions:** Analyse current telemedicine platforms to understand their features, strengths, and weaknesses. Look for gaps that your platform can fill.
- **Market Size:** Evaluate the number of potential users, projected growth in telemedicine adoption, and overall market potential.

Phase 2 Technical Feasibility Analysis:

Technical feasibility assesses whether the proposed platform can be developed with the available technology, skills, and resources.

Which means we need to analyze our skills, resources, and technology capabilities. We have to analyze:

- **Platform Requirements:** Secure video conferencing, electronic health records (EHR), appointment scheduling, prescription management, and health education resources.
- **Technology Stack:** Choose appropriate technologies for front-end (e.g., Flutter for mobile, React for web), back-end (e.g., Node.js, Django), databases (e.g., PostgreSQL, MongoDB), and cloud services (e.g., AWS, Azure).

- **Technical Team:** Ensure availability of developers, designers, and IT support with experience in healthcare applications and telemedicine.
- **Challenges:** Address issues like data privacy and security, reliable internet connectivity in rural areas, and integration with existing healthcare systems.

Phase 3 Financial Feasibility Analysis:

Financial feasibility evaluates the economic viability of the project, including cost estimation and potential return on investment (ROI).

We need to analyze how much it will cost us to build the service and whether we will have any revenue after launching the service. We have to analyze:

Cost Estimation:

- **Development Costs:** Salaries for developers, designers, and IT staff, software licenses, cloud infrastructure, and initial marketing.
- **Operational Costs:** Ongoing salaries, server maintenance, customer support, marketing, and administrative expenses.

Revenue Streams:

- **Subscription Fees**: Monthly or annual fees for patients and doctors.
- **Pay-per-Use Fees:** Charges for each consultation or medical service.
- **Partnerships and Sponsorships:** Collaboration with government agencies, NGOs, and healthcare organizations.
- **Advertising:** Revenue from targeted advertisements for healthcare products and services.

Financial Risks:

- High initial investment with delayed ROI.
- Market adoption may take longer than expected.
- Competition from existing telemedicine platforms.

Benefits:

- Potential to reach a large, underserved market.
- Opportunity to improve healthcare outcomes in rural areas.
- Long-term profitability through sustainable revenue streams.

1.3 Target User and User Profile

1.3.1 Target User

For our service, we have analyses 4 stakeholders.

1. Patient
2. Doctor
3. Assistant
4. Admin

1.3.2 User profile

Table 01: User Profile for Patient

User Class	**Notes on Characteristics**	**Requirement Implied**
Type of user	Patient	Interface
Age range	18-60	
Frequency of use	Few times, in a day	Safety, Security, Performance, Portability
Mandatory/ Discretionary	Must	
Computer experience	Basic to moderate	Interface, Documentation
Education	SSC or HSC	Interface, Documentation
Goals	Consultation with Doctor	Resource, Operation, Documentation
Language Skills	English, Bangla	Interface, Documentation
Number of users	Many	Interface, Security, Safety, Operation
Training	Must be provided	Resource, Documentation
Other system	No	
Ways of working	To get support	Safety, Security, Portability

Table 02: User Profile for Doctor

User Class	**Notes on Characteristics**	**Requirement Implied**
Type of user	Doctor	Interface
Age range	25 – 65	
Frequency of use	Many times, in a day	Safety, Security, Performance, Portability

Mandatory/ Discretionary	Must	
Computer experience	Yes	Interface, Documentation
Education	MBBS or higher	Interface, Documentation
Goals	Provide health service to patient	Resource, Operation, Documentation
Language Skills	English, Bangla	Interface, Documentation
Number of users	Many	Interface, Security, Safety, Operation
Training	Must be provided	Resource, Documentation
Other system	No	
Ways of working	To get support	Safety, Security, Portability

Table 03: User Profile for Assistant

User Class	**Notes on Characteristics**	**Requirement Implied**
Type of user	Assistant	Interface
Age range	20 – 40	
Frequency of use	Many times, in a day	Safety, Security, Performance, Portability
Mandatory/ Discretionary	Must	
Computer experience	Yes	Interface, Documentation
Education	SSC or HSC	Interface, Documentation
Goals	Interact with doctors and patients	Resource, Operation, Documentation
Language Skills	English, Bangla	Interface, Documentation
Number of users	Many	Interface, Security, Safety, Operation
Training	Must be provided	Resource, Documentation
Other system	No	
Ways of working	To get support	Safety, Security, Portability

Table 04: User Profile for Admin

User Class	**Notes on Characteristics**	**Requirement Implied**
Type of user	Admin	Interface
Age range	30 – 50	

Frequency of use	Many times, in a day	Safety, Security, Performance, Portability
Mandatory/ Discretionary	Must	
Computer experience	Yes	Interface, Documentation
Education	Graduated	Interface, Documentation
Goals	Completing all businessrelated work	Resource, Operation, Documentation
Language Skills	English, Bangla	Interface, Documentation
Number of users	One	Interface, Security, Safety, Operation
Training	Must be provided	Resource, Documentation
Other system	No	
Ways of working	To get support	Safety, Security, Portability

1.4 Project Scope

Here is the scope of our project.

1. Registration and Login:

- **a. Objective:** To allow users to register and log in to the system.
- **b. Functionality:** Users will provide necessary information for registration. Secure authentication mechanisms will be implemented for user logins. Password recovery options will be available.

2. Patient Profile:

- **a. Objective:** provide a comprehensive and secure repository of patient information that facilitates personalized healthcare delivery.
- **b. Functionality:** The patient profile allows for comprehensive management of personal information.

3. Patient Medical History:

- **a. Objective:** create a detailed and accessible record of a patient's health background, enabling healthcare providers to make informed decisions and tailor treatment plans.
- **b. Functionality:** This feature will record detailed information on chronic conditions, past treatments, surgeries, allergies, and family medical history. It will also track immunizations, medications, mental health history, and lifestyle factors.

4. Patient Medical Test:

- **a. Objective:** Patient Medical Test feature is to facilitate the management and tracking of diagnostic tests and laboratory results, ensuring that healthcare providers have timely access to critical health information.

b. **Functionality:** Patient can manage test orders, securely store and display results, and integrate with external labs. It will notify patients and providers when results are ready, offer tools for interpretation, and enable patient access with educational resources. The system ensures data privacy, supports multilingual access, and provides analytics to improve diagnostic and treatment processes in remote areas.

5. Doctor's Profile:

a. **Objective:** provide a comprehensive and secure repository of doctor's information that facilitates personalized healthcare delivery.
b. **Functionality:** The doctor's profile allows for comprehensive management of personal information.

6. Video Conferencing:

a. **Objective:** enable real-time, face-to-face consultations between patients in remote areas and healthcare providers.
b. **Functionality:** The video conferencing feature should enable high-quality video and audio, secure communication, appointment scheduling, waiting room functionality, screen sharing, recording and playback, EHR integration, and accessibility features.

7. e-Prescription:

a. **Objective:** The objective of the e-Prescription feature is to streamline the prescription process, ensuring accurate and efficient medication management for patients in remote areas.
b. **Functionality:** The e-prescription feature should enable prescription generation, medication database access, electronic signatures, refill requests, pharmacy integration, security and privacy, EHR integration, and patient education.

8. Online Payment:

a. **Objective:** Provide a seamless billing and payment process for customers.
b. **Functionality:** Automated notifications for booking confirmation, checkout requests, and payment status. Customizable notification preferences for users.

9. Complaints:

a. **Objective:** Complaints feature is to provide a structured mechanism for patients and healthcare providers to voice concerns and feedback regarding the telemedicine services.
b. **Functionality:** User can submit complaints, track complaints, collect feedbacks.

10. Data Report:

a. **Objective:** extract valuable insights from patient data to improve healthcare delivery, identify trends, and inform public health policies.
b. **Functionality:** Main functionalities are data collection and integration, data cleaning and preparation, disease surveillance, population health analysis, quality improvement.

1.5 Tentative Elicitation Process

The **elicitation process** for gathering system requirements involves collecting information from stakeholders, analyzing their needs, and translating them into functional and non-functional system requirements. Below is a tentative process that can be followed to gather the necessary information:

1. **Identify Stakeholders**
    a) Patients
    b) Doctor
    c) Assistant
    d) Admin
2. **Elicitation Techniques**

Interviews:

- Doctors to understand diagnostic needs, patient record management, and workflow.
- Patients to identify ease of use, accessibility, and desired features.
- IT staff to discuss system integration and security.

Surveys and Questionnaires:

- Patients to gather feedback on desired features (e.g., video calls, prescription management).
- Healthcare providers to prioritize clinical tools and functionalities.

Observation:

- Current workflows in clinics and hospitals to identify inefficiencies that telemedicine can address.

Document Analysis:

- Existing healthcare records systems.
- Legal guidelines for telemedicine practices.
- User feedback from other telemedicine platforms.

3.Define Goals Objective:

Understand the scope and key stakeholders of the telemedicine system.

- Enhance accessibility to healthcare.
- Provide secure and real-time remote consultations.

- Maintain compliance with healthcare regulations (e.g., HIPAA, GDPR).

- **Research:**

- Study existing telemedicine solutions and their limitations.
- Understand the regulatory and legal requirements.
- Analyze technical infrastructure needs (e.g., network reliability, platform scalability).

4.Gather Requirement:

- **Functional Requirements:**

- Secure user authentication.
- Video/audio consultation capability.
- Appointment scheduling and reminders.
- Integration with electronic health records (EHR).
- Prescription generation and sharing.
- Real-time chat or messaging support.

- **Non-Functional Requirements:**

- High availability and scalability.
- Data security and privacy (encryption, compliance with laws).
- User-friendly interface for patients and doctors.
- Cross-platform compatibility (web and mobile).
- Minimal latency in video and chat features.

5. Validation and Review

Objective: Ensure the requirements are accurate, feasible, and meet stakeholder expectations.

- **Prototyping:**

- Develop mockups or prototypes for key functionalities and gather stakeholder feedback
- **Workshops**
- Conduct workshops with stakeholders to validate requirements.

6.Requirement Prioritization:

- Use techniques like Moscow (Must have, Should have, Could have, Won't have) to prioritize features.

7. Documentation

- **Prepare Requirement Specification Documents:**
- Functional Requirement Specification (FRS).
- Software Requirement Specification (SRS).

- **Distribute for Review:**
- Share with stakeholders for final validation and approval.

1.6 System Requirements

1.6.1 Hardware Requirements

For End Users (Patients and Doctors):

- **Smartphones/Tablets:** Android or iOS with 2 GB RAM, front-facing camera, and 3G/4G/LTE or Wi-Fi.
- **Desktops/Laptops:** Dual-core CPU, 4 GB RAM, camera, microphone, and broadband or Wi-Fi.

For Local Health Facilities:

- **Devices:** Desktops or tablets with similar specs as above. • **Network:** Routers, modems, and backup power supplies.

For Backend Infrastructure:

- **Servers:** Cloud-based (AWS, Azure, Google Cloud) or local servers with Quad-Core CPU, 16 GB RAM, and SSD storage.

1.6.2 Software Requirements

Mobile Application:

- Platforms: Android (Google Play), iOS (App Store).
- Framework: Flutter or React Native.

Web Application:

- Frontend: HTML5, CSS3, JavaScript (React, Angular).

- Backend: Node.js, Django.

Backend Services:

- **Database:** PostgreSQL, MongoDB.
- **APIs:** RESTful APIs.
- **Video Conferencing:** WebRTC, Zoom API, Twilio API.
- **Authentication:** OAuth2.0, JWT.

1.6.3 Constraints and Dependencies

Constraints:

Network Connectivity:

- Ensuring reliable internet in remote areas.
- Managing low bandwidth for video calls.

Regulatory Compliance:

- Meeting healthcare regulations like HIPAA, GDPR.
- Adhering to data residency rules.

User Adoption:

- Creating a user-friendly interface for varying tech literacy.
- Providing training and support in rural regions.

Security:

- Protecting sensitive health data with robust measures.
- Preventing unauthorized access.

Dependencies:

- Third-Party Services
- Government and Regulatory Bodies:
- Local Health Facilities and Workers
- Technology Providers

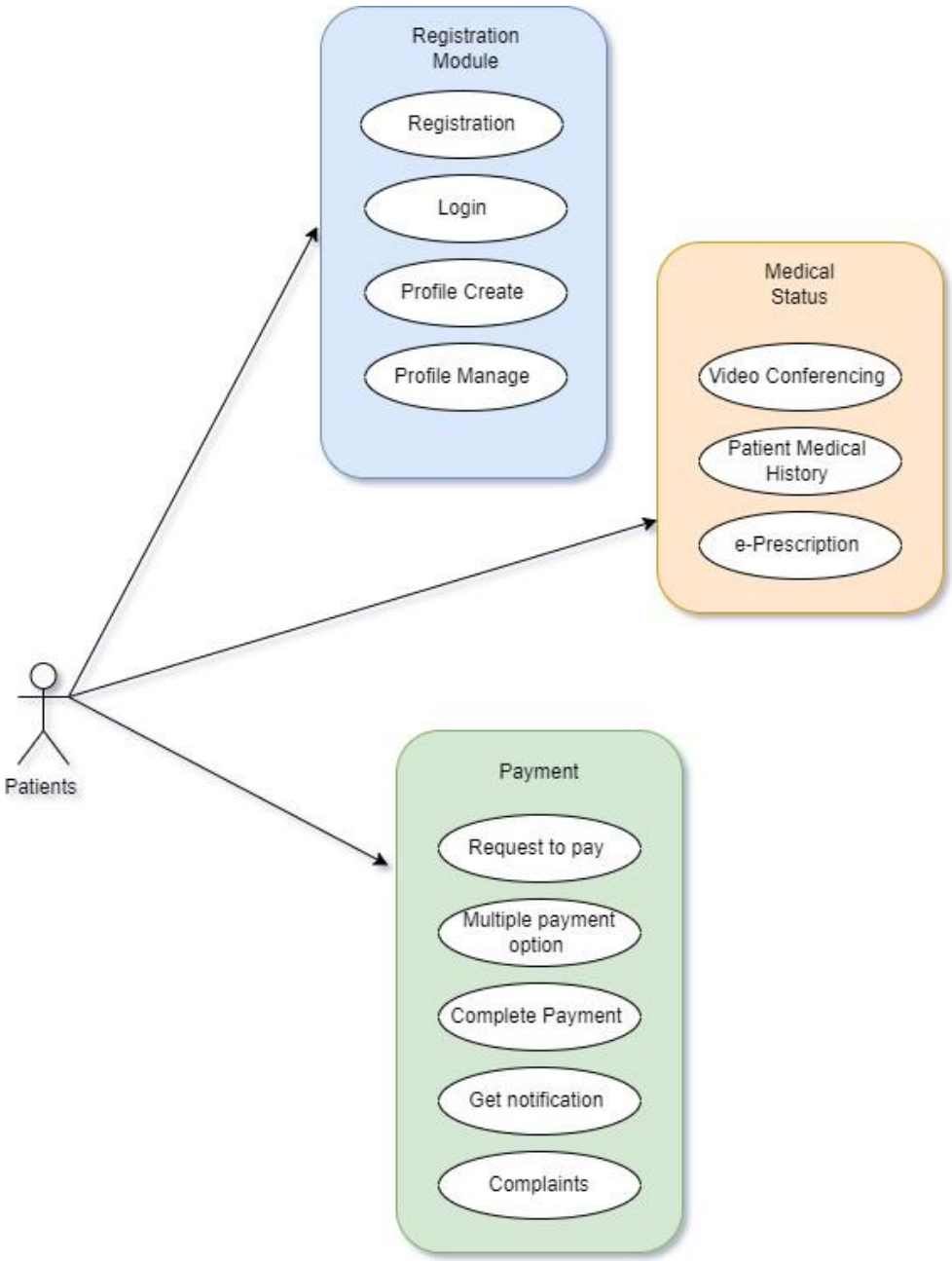
CHAPTER 2 DESIGN AND IMPLEMENTATION

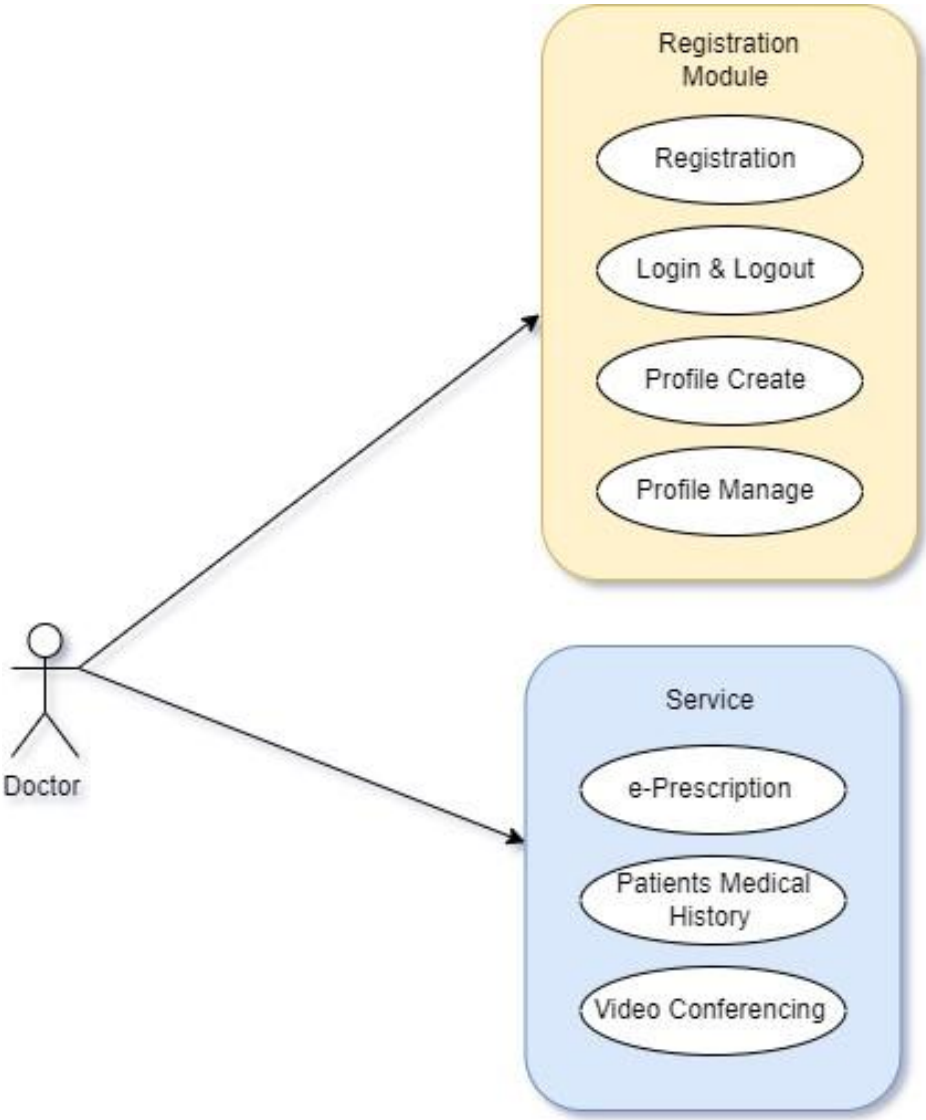
2.1 Introduction

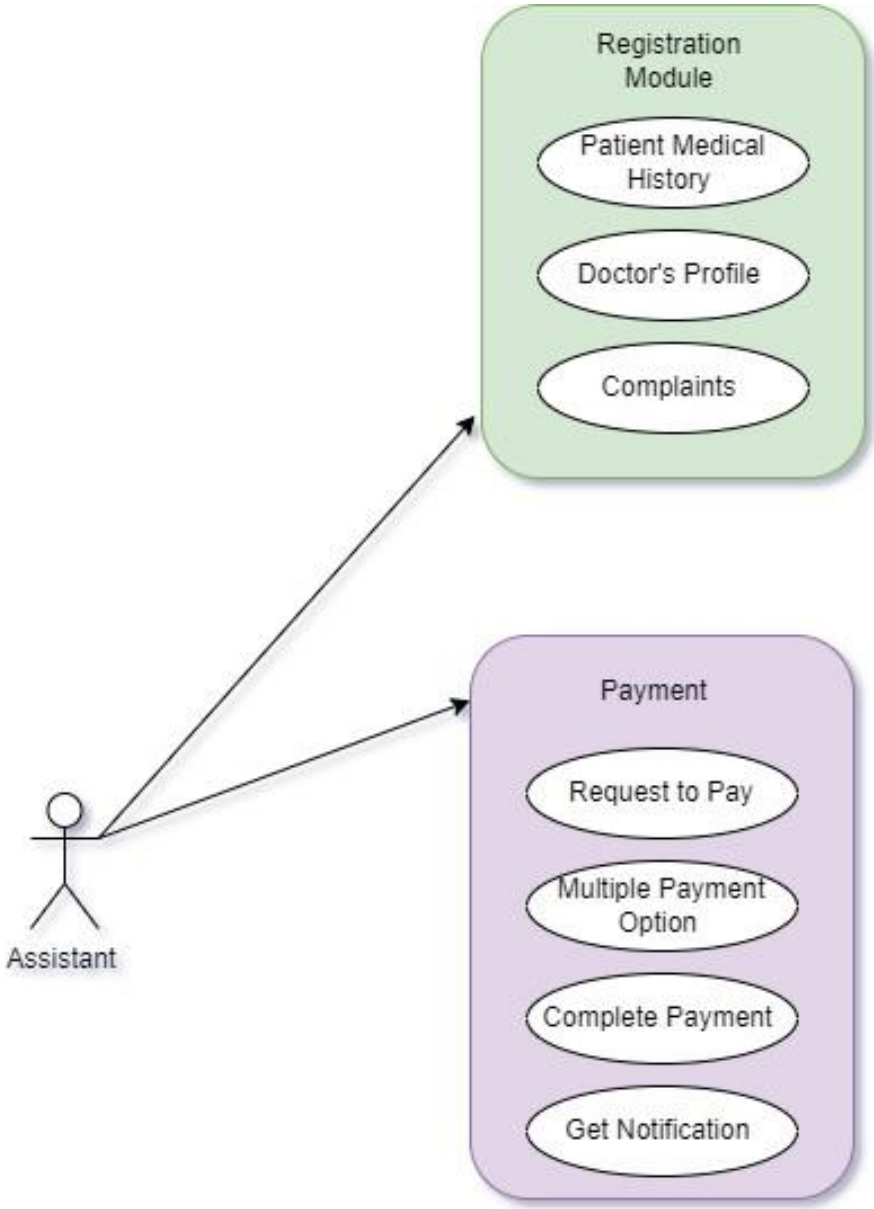
In this chapter, we will cover all the designs and road maps of how we are implementing the features in our system.

2.2 System Block Diagram

A block diagram is a high-level visual representation of the various components and their interactions within a system. For our telemedicine platform aimed at providing healthcare services to remote areas, the block diagram will illustrate the key modules and their relationships.


Registration Module
Registration
Login
Profile Create
Profile Manage
Medical Status
Video Conferencing
Patient Medical History
e-Prescription
Patients
Payment
Request to pay
Multiple payment option
Complete Payment
Get notification
Complaints


Registration Module
Registration
Login & Logout
Profile Create
Profile Manage
Service
e-Prescription
Patients Medical History
Video Conferencing
Doctor


Registration Module
Patient Medical History
Doctor's Profile
Complaints
Payment
Request to Pay
Multiple Payment Option
Complete Payment
Get Notification
Assistant

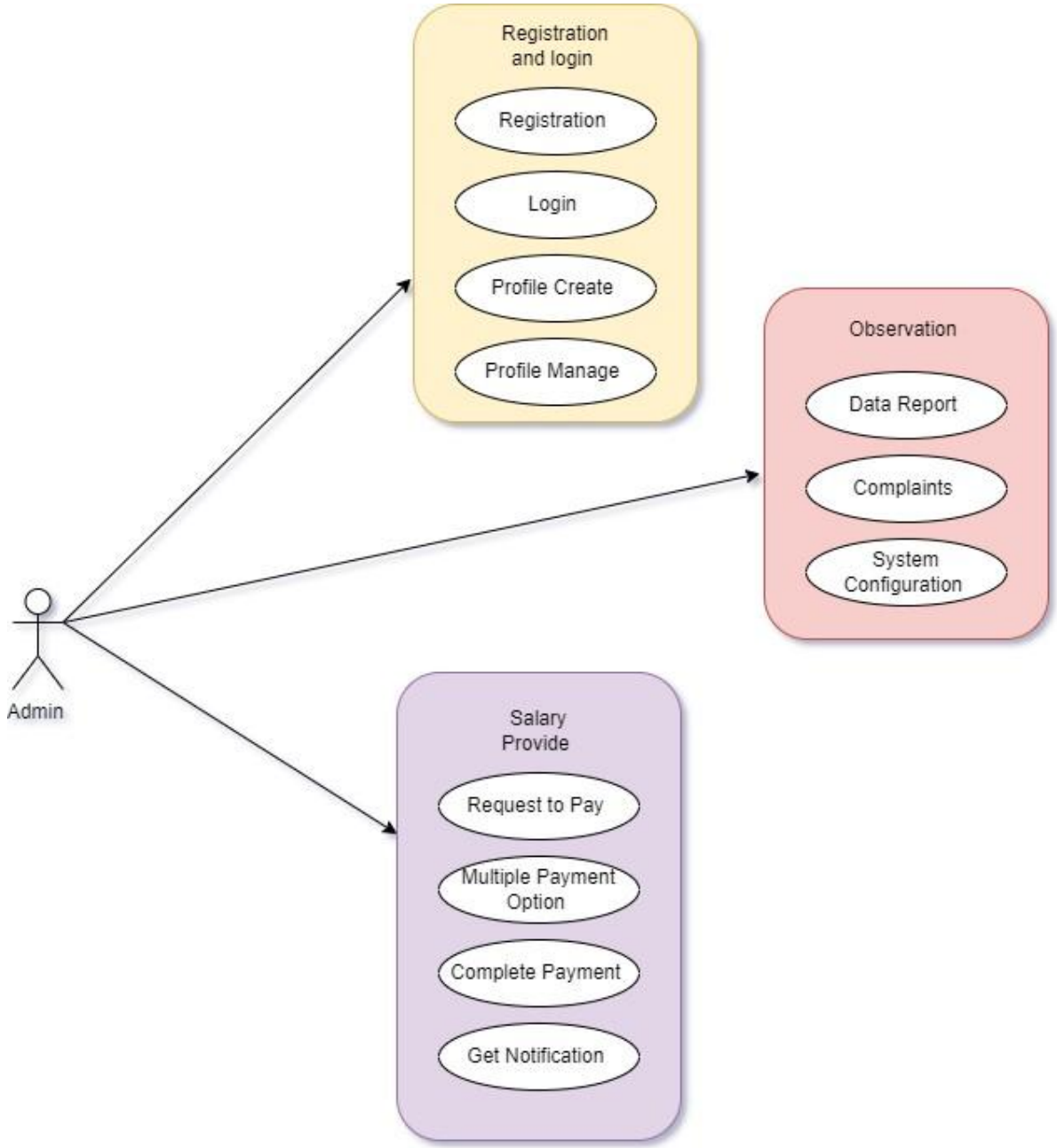


Figure 1: System Block Diagram

2.3 Functional Requirements

In this section we are gather some requirements and implementing to the system and these are functional requirements.

FR 01	Registration
Description	All users (patients, doctors, administrators, assistants) must be able to register in the telemedicine system to access its features.
Stakeholder	Patient, Doctor, Admin, Assistant

FR 02	Login
Description	All users must log in before using the system.
Stakeholder	Patient, Doctor, Admin, Assistant

FR 03	Logout
Description	All users can log out from the system once their session is completed.
Stakeholder	Patient, Doctor, Admin, Assistant

FR 04	Forget Password
Description	Users can recover their passwords using a "Forgot Password" feature.
Stakeholder	Patient, Doctor, Admin, Assistant

FR 05	Create Profile (Patient)
Description	Patients must create a profile in the system to access medical services.
Stakeholder	Patient

FR 06	Create Profile (Doctor)
Description	Doctors must create a profile to offer medical services.
Stakeholder	Doctor

FR 07	Create Profile (Assistant)
Description	Assistant must create a profile in the system to access medical services.
Stakeholder	Assistant

FR 08	Create Profile (Admin)
Description	Admin must create a profile in the system to access medical services.
Stakeholder	Admin

FR 09	View Profile (Patient)
Description	Patient can view their profile in the system.
Stakeholder	Patient, Doctor, Assistant

FR 10	View Profile (Doctor)
Description	Doctors can view their profiles in the system.
Stakeholder	Patient, Doctor, Assistant

FR 11	View Profile (Assistant)

Description	Assistant can view their profile is the system
Stakeholder	Doctor, Assistant, Admin

FR 12	View Profile (Admin)
Description	Admin can view their profiles in the system.
Stakeholder	Admin

FR 13	Update Patient Medical History
Description	Doctors can update a patient's medical history, e-Prescription after consultations or treatments, medical test
Stakeholder	Doctor, Patient

FR 14	View Patient Medical History
Description	Both patients and doctors can view the patient's medical history, ePrescription, medical test
Stakeholder	Doctor, Patient, Assistant

FR 15	Video Conferencing
Description	Patients can schedule video consultations with doctors, and both can conduct video conferencing within the system.
Stakeholder	Doctor, Patient

FR 16	Make Payment
Description	Patients can make payments for consultations or medical services.
Stakeholder	Patient

FR 17	Payment Confirmation
Description	After a successful payment, the system will confirm the payment to the patient.
Stakeholder	Patient, Admin

FR 18	Request Complaints
Description	Patients and doctors can request or submit complaints related to their experiences or issues encountered in the system.
Stakeholder	Patient, Doctor

FR 19	View Complaints
Description	Administrators can view all filed complaints and manage them.
Stakeholder	Patient, Doctor, Admin

FR 20	Create Data Report

Description	System administrators can create reports based on usage data or medical activities in the system.
Stakeholder	Admin

FR 21	Update Data Report
Description	Administrators can update existing data reports.
Stakeholder	Admin

FR 22	View Data Report
Description	Administrators can view data reports for insights into system usage and performance.
Stakeholder	Admin

2.4 Non-Functional Requirements

The telemedicine system is built for efficiency, security, and growth. It delivers fast performance, handling high user traffic seamlessly, while safeguarding data with encryption, SSL-secured transactions, and role-based access control. Its intuitive and mobile-friendly interface ensures ease of use for patients, doctors, assistants, and administrators. Designed for scalability, it supports expanding data, user bases, and international markets with multi-language and multi-currency features. With 99.9% uptime and automated backups, it ensures reliability, and strict compliance with regulations like GDPR and PCI-DSS guarantees trust and security.

1. **Performance:**
   - The system should load within 2-3 seconds for any page.
   - The system should handle up to 500 concurrent users without performance degradation
2. **Security:**
   - User data (personal, payment) should be stored securely using encryption.
   - The system should implement role-based access control to restrict sensitive operations to authorized users.
   - All transactions must be secure with SSL encryption.

3. **Usability:**
   - The system should have an intuitive, easy-to-navigate interface for patient, doctor, assistant, admin.
   - The system should be responsive and mobile-friendly, providing a seamless experience on various devices.
4. **Scalability:**
   - The system should be able to handle increasing amounts of data, users, and transactions as the business grows.

- The system should support multi-language and multi-currency features to expand to international markets.

5. **Availability:**
   - The system should have an uptime of 99.9% to ensure continuous operation.
   - The system should have automated backups to prevent data loss.
6. **Compliance:**
   - The system must comply with local data protection regulations (e.g., GDPR for European customers).
   - Payment processing should meet PCI-DSS standards.

Chapter 3 Object-oriented System design using UML

3.1 Use Case Diagram

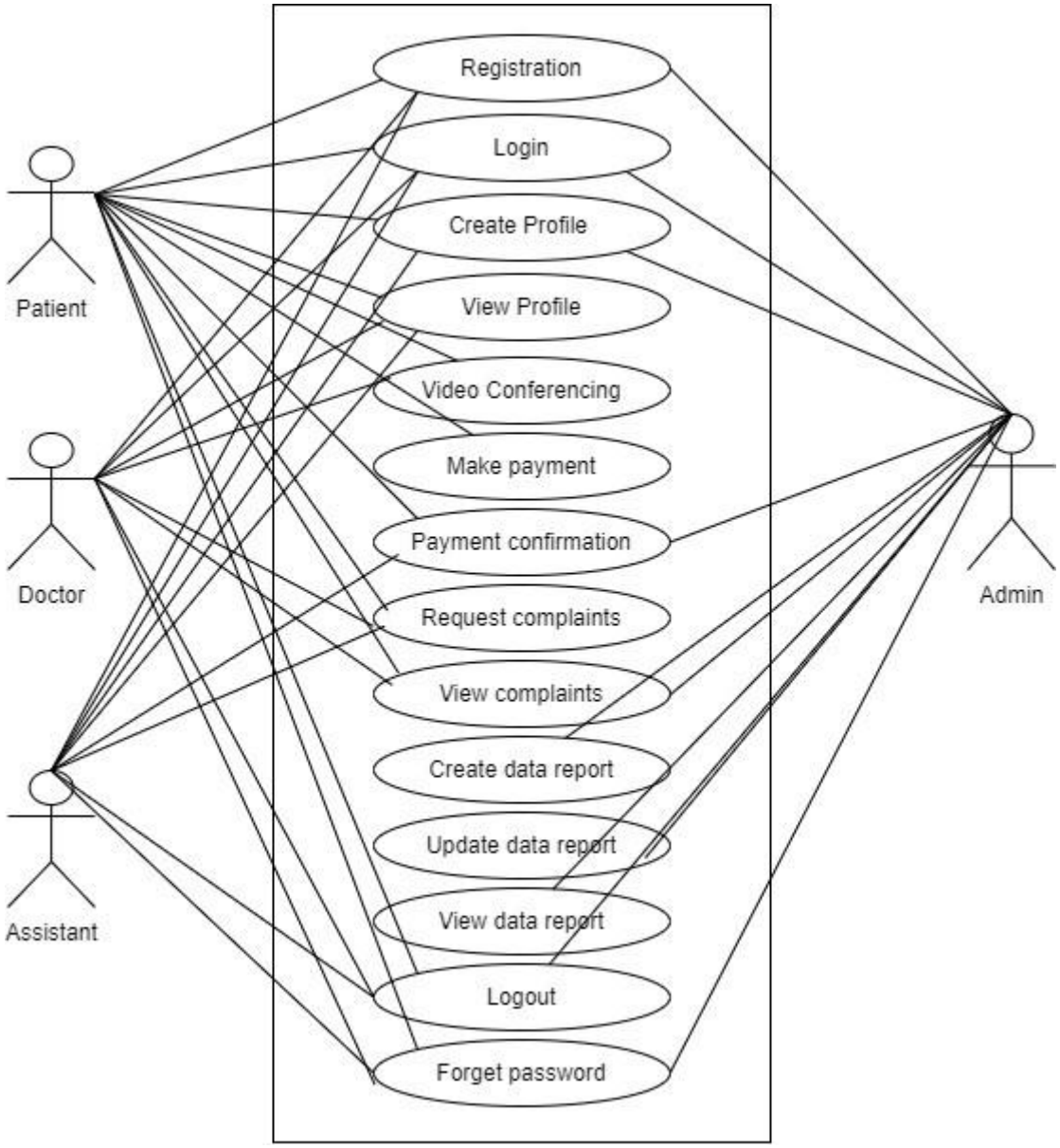


Figure 2: Use case Diagram

3.2 Case Description

Case Description-01: Registration

<table>
<tr><td>Use Case</td><td>Registration</td></tr>
<tr><td>Goal</td><td>Users can register to sign in to the system.</td></tr>
<tr><td>Precondition</td><td>Users must install the Hotel Management app for registration.</td></tr>
<tr><td>Success End Condition</td><td>Notification: !!!Successfully Registered!!!</td></tr>
<tr><td>Failed End Condition</td><td>Notification: “Submission Not Submitted”</td></tr>
<tr><td>Primary Actors:

Secondary Actors:</td><td>Patient, Doctor, Admin, Assistant

None</td></tr>
<tr><td>Trigger</td><td>User will request a registration form to fill up</td></tr>
<tr><td>Description / Main Success Scenario</td><td>
<table>
<tr><td>1.</td><td>Press “Registration” Button</td></tr>
<tr><td>2.</td><td>Provide registration form</td></tr>
<tr><td>3.</td><td>Enter Information</td></tr>
<tr><td>4.</td><td>Press “Submit” Button.</td></tr>
<tr><td>5.</td><td>Information saved</td></tr>
<tr><td>6.</td><td>The system saves the details and shows them !!!Successfully Registered!!! Notify</td></tr>
</table>
</td></tr>
<tr><td>Alternative Flows</td><td>
<table>
<tr><td>1.1</td><td>System Error</td></tr>
<tr><td></td><td>1.1.a. Try Again!!</td></tr>
<tr><td>2.1</td><td>System Doesn't work.</td></tr>
<tr><td></td><td>2.1.a. Try Again Later!</td></tr>
<tr><td>4.1</td><td>The user Did not fill up the details!</td></tr>
<tr><td></td><td>4.1.a. Checked By the system & notify by “Please! Fill Up the Box”.</td></tr>
<tr><td>5.1</td><td>The system did not respond</td></tr>
<tr><td></td><td>5.1.a. Show Error Message.</td></tr>
<tr><td>6.1</td><td>The system Doesn’t save the details.</td></tr>
<tr><td></td><td>6.1.a. Notification: “Details did not Save”</td></tr>
</table>
</td></tr>
<tr><td>Quality Requirements</td><td>The user Will fill up all the details in 30 minutes.</td></tr>
</table>

Case Description-

02: Login

<table>
<tr><td>Use Case</td><td>Login</td></tr>
<tr><td>Goal</td><td>Users can enter the system by the login.</td></tr>
<tr><td>Precondition</td><td>Users must have to be registered First.</td></tr>
<tr><td>Success End Condition</td><td>Notification: “Login Successful”</td></tr>
<tr><td>Failed End Condition</td><td>Notification: “Login Failed!!”</td></tr>
<tr><td>Primary Actors:

Secondary Actors:</td><td>Patient, Doctor, Admin, Assistant

None</td></tr>
<tr><td>Trigger</td><td>The user will request a login to enter the system</td></tr>
<tr><td>Description / Main Success Scenario</td><td><table>
<tr><td>1.</td><td>Press “Login” Button</td></tr>
<tr><td>2.</td><td>Provide login interface</td></tr>
<tr><td>3.</td><td>Enter user id and password.</td></tr>
<tr><td>4.</td><td>User provide the “Login” button</td></tr>
<tr><td>5.</td><td>Verified and login</td></tr>
<tr><td>6.</td><td>Notification: “Login Successful”</td></tr>
</table></td></tr>
<tr><td>Alternative Flows</td><td><table>
<tr><td>1.1</td><td>System Error</td></tr>
<tr><td></td><td>1.1.a. Try again</td></tr>
<tr><td>2.1</td><td>Server Not Found</td></tr>
<tr><td></td><td>2.1.a. Try Again Later!</td></tr>
<tr><td>4.1</td><td>The system Did not respond.</td></tr>
<tr><td></td><td>4.1.a. Show error message.</td></tr>
<tr><td>5.1</td><td>Information Error!!</td></tr>
<tr><td></td><td>5.1.a. Notification: “Enter the right User ID and Password.”</td></tr>
</table></td></tr>
</table>

Case Description-

Quality Requirements	Users fill up the login info within 10 minutes.

03: Logout

Use Case	Logout	
Goal	Users can Log Out from the system.	
Precondition	The user must log in to the system.	
Success End Condition	Notification: “Logout Successful”.	
Failed End Condition	Notification: “System Error”.	
Primary Actors: Secondary Actors:	Patient, Doctor, Admin, Assistant None	
Trigger	The user will request a Logout	
Description / Main Success Scenario	1.	Log in to the system.
	2.	Select the “Logout” Option.
	3.	Press the “Logout” Button.
	4.	Logout successful
Alternative Flows	1.1	Server down
		1.1.a try again
	2.1	Not Responding
		2.1.a Try again
	3.1	Not Responding
		3.1.a Reload
Quality Requirements	The user will Immediately Logout After hitting the Logout Button.	

Case Description-

04: Forget Password

<table>
<tr><td>Use Case</td><td>Forget Password</td></tr>
<tr><td>Goal</td><td>Users can restore forgotten passwords.</td></tr>
<tr><td>Precondition</td><td>The user must log in to the system.</td></tr>
<tr><td>Success End Condition</td><td>Notification: “Password Restored Successfully”.</td></tr>
<tr><td>Failed End Condition</td><td>Notification: “Password Restored Failed.”</td></tr>
<tr><td>Primary Actors:

Secondary Actors:</td><td>Patient, Doctor, Admin, Assistant</td></tr>
<tr><td>Trigger</td><td>The user will request to Restore the pin.</td></tr>
<tr><td>Description / Main Success Scenario</td><td><table>
<tr><td>1.</td><td>Log in to the system.</td></tr>
<tr><td>2.</td><td>Select the “Forget Password” Option.</td></tr>
<tr><td>3.</td><td>Enter the registered number</td></tr>
<tr><td>4.</td><td>Press the “Send Verification Code” Button.</td></tr>
<tr><td>5.</td><td>Enter the verification code</td></tr>
<tr><td>6.</td><td>Set new password</td></tr>
<tr><td>7.</td><td>Press “Save & Apply”.</td></tr>
</table></td></tr>
<tr><td>Alternative Flows</td><td><table>
<tr><td>1.1</td><td>Server down</td></tr>
<tr><td></td><td>1.1.a try again</td></tr>
<tr><td>2.1</td><td>Not Responding</td></tr>
<tr><td></td><td>2.1.a Reload</td></tr>
<tr><td>3.1</td><td>Wrong phone number</td></tr>
<tr><td></td><td>3.1.a Notification: Choose the Valid Phone Number.</td></tr>
<tr><td>5.1</td><td>Wrong OTP Code</td></tr>
<tr><td></td><td>5.1.a Notification: Choose the Valid OTP Code.</td></tr>
<tr><td>6.1</td><td>System Error</td></tr>
<tr><td></td><td>6.1.a. Try again</td></tr>
</table></td></tr>
</table>

Case Description-

Quality Requirements	Users will get 30 mins to fill up

05: Create Profile (Patient)

Use Case:	Create Profile (Patient)	
Goal:	Allow patients to create a profile in the system to access medical services.	
Precondition:	The user must have registered in the system.	
Success End Condition:	Notification: *"Profile Created Successfully!"*	
Failed End Condition:	Notification: *"Profile Creation Failed!"*	
Primary Actors: Secondary Actors:	Patient None	
Trigger	The patient clicks on the "Create Profile" button after logging in.	
Description / Main Success Scenario	1.	The patient logs in and clicks on the "Create Profile" button.
	2.	The system provides a form to enter personal details (name, age, gender, contact information, medical history, etc.).
	3.	The patient enters the required details and presses the "Submit" button.
	4.	The system verifies the provided information.
	5.	The system saves the details and displays the message: *"Profile Created Successfully!"*
Alternative Flows	2.1	Form submission error
		2.1.a Notify: *"Form submission error. Please try again later!"*
	3.1	Missing required information
		3.1.a Notify: *"Please fill in all required fields!"*
	4.1	System verification failure
		4.1.a Notify: *"Failed to verify information. Please check and resubmit!"*
	5.1	System fails to save the profile
		5.1.a Notify: *"Profile Creation Failed!"*

Case Description-

Quality Requirements	• The patient must complete the profile creation process within 15 minutes. • The system should validate the provided data (e.g., correct format for contact details). • The system should ensure that the profile data is securely stored in compliance with privacy standards.

06: Create Profile (Doctor)

Use Case:	Create Profile (Doctor)	
Goal:	Allow patients to create a profile in the system to access medical services.	
Precondition:	The user must have registered in the system.	
Success End Condition:	Notification: *"Profile Created Successfully!"*	
Failed End Condition:	Notification: *"Profile Creation Failed!"*	
Primary Actors: Secondary Actors:	Doctor None	
Trigger	The patient clicks on the "Create Profile" button after logging in.	
Description / Main Success Scenario	1.	The patient logs in and clicks on the "Create Profile" button.
	2.	The system provides a form to enter personal details (name, age, gender, contact information, medical history, etc.).
	3.	The patient enters the required details and presses the "Submit" button.
	4.	The system verifies the provided information.
	5.	The system saves the details and displays the message: *"Profile Created Successfully!"*
Alternative Flows	2.1	Form submission error
		2.1.a Notify: *"Form submission error. Please try again later!"*
	3.1	Missing required information
		3.1.a Notify: *"Please fill in all required fields!"*
	4.1	System verification failure

Case Description-

		4.1.a Notify: *"Failed to verify information. Please check and resubmit!"*
	5.1	System fails to save the profile
		5.1.a Notify: *"Profile Creation Failed!"*
Quality Requirements	• The patient must complete the profile creation process within 15 minutes. • The system should validate the provided data (e.g., correct format for contact details). • The system should ensure that the profile data is securely stored in compliance with privacy standards.	

07: Create Profile (Assistant)

Use Case:	Create Profile (Assistant)	
Goal:	Allow patients to create a profile in the system to access medical services.	
Precondition:	The user must have registered in the system.	
Success End Condition:	Notification: *"Profile Created Successfully!"*	
Failed End Condition:	Notification: *"Profile Creation Failed!"*	
Primary Actors: Secondary Actors:	Patient None	
Trigger	The patient clicks on the "Create Profile" button after logging in.	
Description / Main Success Scenario	1.	The patient logs in and clicks on the "Create Profile" button.
	2.	The system provides a form to enter personal details (name, age, gender, contact information, medical history, etc.).
	3.	The patient enters the required details and presses the "Submit" button.
	4.	The system verifies the provided information.
	5.	The system saves the details and displays the message: *"Profile Created Successfully!"*

Case Description-

<table>
<tr><td>Alternative Flows</td><td><table>
<tr><td>2.1</td><td>Form submission error</td></tr>
<tr><td></td><td>2.1.a Notify: "Form submission error. Please try again later!"</td></tr>
<tr><td>3.1</td><td>Missing required information</td></tr>
<tr><td></td><td>3.1.a Notify: "Please fill in all required fields!"</td></tr>
<tr><td>4.1</td><td>System verification failure</td></tr>
<tr><td></td><td>4.1.a Notify: "Failed to verify information. Please check and resubmit!"</td></tr>
<tr><td>5.1</td><td>System fails to save the profile</td></tr>
<tr><td></td><td>5.1.a Notify: "Profile Creation Failed!"</td></tr>
</table></td></tr>
<tr><td>Quality Requirements</td><td>• The patient must complete the profile creation process within 15 minutes.
• The system should validate the provided data (e.g., correct format for contact details).
• The system should ensure that the profile data is securely stored in compliance with privacy standards.</td></tr>
</table>

Case Description-08: Create Profile (Admin)

Use Case:	Create Profile (Admin)
Goal:	Allow patients to create a profile in the system to access medical services.
Precondition:	The user must have registered in the system.
Success End Condition:	Notification: *"Profile Created Successfully!"*
Failed End Condition:	Notification: *"Profile Creation Failed!"*
Primary Actors: Secondary Actors:	Patient None
Trigger	The patient clicks on the "Create Profile" button after logging in.
Description / Main Success Scenario	1. The patient logs in and clicks on the "Create Profile" button. 2. The system provides a form to enter personal details (name, age, gender, contact information, medical history, etc.). 3. The patient enters the required details and presses the "Submit" button. 4. The system verifies the provided information. 5. The system saves the details and displays the message: *"Profile Created Successfully!"*
Alternative Flows	2.1 Form submission error 2.1.a Notify: *"Form submission error. Please try again later!"* 3.1 Missing required information 3.1.a Notify: *"Please fill in all required fields!"* 4.1 System verification failure 4.1.a Notify: *"Failed to verify information. Please check and resubmit!"* 5.1 System fails to save the profile 5.1.a Notify: *"Profile Creation Failed!"*
Quality Requirements	• The patient must complete the profile creation process within 15 minutes. • The system should validate the provided data (e.g., correct format for contact details). • The system should ensure that the profile data is securely stored in compliance with privacy standards.

Case Description-

09: View Profile (Patient)

<table>
<tr><td>Use Case:</td><td colspan="2">View Profile (Patient)</td></tr>
<tr><td>Goal:</td><td colspan="2">Allow patients, doctors, and assistants to view a patient's profile in the system.</td></tr>
<tr><td>Precondition:</td><td colspan="2">The patient must have an existing profile in the system. The doctor or assistant must have appropriate permissions to access the patient's profile.</td></tr>
<tr><td>Success End Condition:</td><td colspan="2">The profile information is displayed successfully.</td></tr>
<tr><td>Failed End Condition:</td><td colspan="2">Notification: "Failed to load profile!"</td></tr>
<tr><td>Primary Actors:

Secondary Actors:</td><td colspan="2">Patient, Doctor, Assistant

None</td></tr>
<tr><td>Trigger</td><td colspan="2">The patient, doctor, or assistant selects the "View Profile" option.</td></tr>
<tr><td>Description / Main Success Scenario</td><td>1.</td><td>The user (patient, doctor, or assistant) logs in and selects "View Profile" from the dashboard.</td></tr>
<tr><td></td><td>2.</td><td>The system retrieves the patient’s profile information (personal details, medical history, contact details, etc.).</td></tr>
<tr><td></td><td>3.</td><td>The system displays the patient's profile.</td></tr>
<tr><td>Alternative Flows</td><td>2.1</td><td>System error while retrieving profile</td></tr>
<tr><td></td><td></td><td>2.1.a Notify: "Error retrieving profile. Please try again later!"</td></tr>
<tr><td></td><td>3.1</td><td>Profile data not found</td></tr>
<tr><td></td><td></td><td>3.1.a Notify: "No profile found. Please create a profile first!"</td></tr>
<tr><td></td><td>3.2</td><td>Insufficient permissions to view profile (doctor/assistant)</td></tr>
<tr><td></td><td></td><td>3.2.a Notify: "Access Denied. You do not have permission to view this profile!"</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Quality Requirements</td><td colspan="2">• The profile should be loaded and displayed within 5 seconds.
• The system should ensure that only authorized users (patients, doctors, assistants) can view the profile.
• The displayed data must be up-to-date and comply with privacy standards.</td></tr>
</table>

Case Description-

10: **View Profile (Doctor)**

Use Case:	View Profile (Doctor)
Goal:	Allow doctors, patients, and assistants to view a doctor's profile in the system.
Precondition:	The doctor must have an existing profile in the system. Patients and assistants must have appropriate permissions to access the doctor's profile.
Success End Condition:	The doctor's profile information is displayed successfully.
Failed End Condition:	Notification: *"Failed to load profile!"*
Primary Actors: Secondary Actors:	Doctor, Patient, Assistant None
Trigger	The doctor, patient, or assistant selects the "View Profile" option.
Description / Main Success Scenario	1. The user (doctor, patient, or assistant) logs in and selects "View Profile" from the dashboard. 2. The system retrieves the doctor's profile information (name, qualifications, specialization, contact information, etc.). 3. The system displays the doctor's profile.
Alternative Flows	2.1 System error while retrieving profile **2.1.a** Notify: *"Error retrieving profile. Please try again later!"* 3.1 Profile data not found **3.1 3.1.a** Notify: *"No profile found. Please create a profile first!"* 3.2 Insufficient permissions to view profile (patient/assistant) **3.2.a** Notify: *"Access Denied. You do not have permission to view this profile!"*
Quality Requirements	• The profile should be loaded and displayed within 5 seconds. • The system should ensure that only authorized users (doctors, patients, assistants) can view the profile. • The displayed data must be accurate and comply with healthcare privacy standards.

Case Description-

11: View Profile (Assistant)

<table>
<tr><td>Use Case:</td><td>View Profile (Assistant)</td></tr>
<tr><td>Goal:</td><td>Allow assistants, doctors, and admins to view an assistant's profile in the system.</td></tr>
<tr><td>Precondition:</td><td>The assistant must have an existing profile in the system.
Doctors and admins must have appropriate permissions to access the assistant's profile.</td></tr>
<tr><td>Success End Condition:</td><td>The assistant's profile information is displayed successfully.</td></tr>
<tr><td>Failed End Condition:</td><td>Notification: "Failed to load profile!"</td></tr>
<tr><td>Primary Actors:

Secondary Actors:</td><td>Assistant, Doctor, Admin

None</td></tr>
<tr><td>Trigger</td><td>The assistant, doctor, or admin selects the "View Profile" option.</td></tr>
<tr><td>Description / Main Success Scenario</td><td><table>
<tr><td>1.</td><td>The user (assistant, doctor, or admin) logs in and selects "View Profile" from the dashboard.</td></tr>
<tr><td>2.</td><td>The system retrieves the assistant's profile information (name, contact information, role details, etc.).</td></tr>
<tr><td>3.</td><td>The system displays the assistant's profile.</td></tr>
</table></td></tr>
<tr><td>Alternative Flows</td><td><table>
<tr><td>2.1</td><td>System error while retrieving profile</td></tr>
<tr><td></td><td>2.1.a Notify: "Error retrieving profile. Please try again later!"</td></tr>
<tr><td>3.1</td><td>Profile data not found</td></tr>
<tr><td></td><td>3.1.a Notify: "No profile found. Please create a profile first!"</td></tr>
<tr><td>3.2</td><td>Insufficient permissions to view profile (doctor/admin)</td></tr>
<tr><td></td><td>3.2.a Notify: "Access Denied. You do not have permission to view this profile!"</td></tr>
</table></td></tr>
<tr><td>Quality Requirements</td><td>• The profile should be loaded and displayed within 5 seconds.
• The system must ensure that only authorized users (assistants, doctors, admins) can view the profile.
• The displayed data must be accurate and comply with privacy and security standards.</td></tr>
</table>

Case Description-

12: View Profile (Admin)

Use Case:	View Profile (Admin)	
Goal:	Allow admins to view their profile in the system.	
Precondition:	The admin must have an existing profile in the system.	
Success End Condition:	The admin's profile information is displayed successfully.	
Failed End Condition:	Notification: *"Failed to load profile!"*	
Primary Actors: Secondary Actors:	Admin None	
Trigger	The admin selects the "View Profile" option.	
Description / Main Success Scenario	1.	The admin logs in and selects "View Profile" from the dashboard.
	2.	The system retrieves the admin's profile information (name, contact information, role details, etc.).
	3.	The system displays the admin's profile.
Alternative Flows	2.1	System error while retrieving profile
		2.1.a Notify: *"Error retrieving profile. Please try again later!"*
	3.1	Profile data not found
		3.1.a Notify: *"No profile found. Please create a profile first!"*
Quality Requirements	• The profile should be loaded and displayed within 5 seconds. • The system must ensure that the profile is only accessible to the logged-in admin. • The displayed data must be accurate and comply with privacy and security regulations.	

Case Description-13: Update Patient Medical History

Use Case:	Update Patient Medical History
Goal:	Allow doctors to update a patient's medical history, including eprescriptions, after consultations or treatments, and record medical test results.
Precondition:	The doctor must be logged in and have appropriate permissions to update the patient's medical history. The patient must have an existing profile and medical history in the system.
Success End Condition:	Notification: *"Medical History Updated Successfully!"*

Case Description-

Failed End Condition:	Notification: *"Failed to Update Medical History!"*
Primary Actors: Secondary Actors:	Doctor Patient

Trigger	The doctor selects the "Update Medical History" option after a consultation or treatment.	
Description / Main Success Scenario	1.	The doctor logs in and selects the patient's profile.
	2.	The doctor clicks on the "Update Medical History" button.
	3.	The system provides a form to input updated medical information (consultation notes, test results, eprescriptions, etc.).
	4.	The doctor enters the necessary information and submits the form.
	5.	The system displays the message: *"Medical History Updated Successfully!"*
	6.	The system verifies the data and updates the patient's medical history.
Alternative Flows	**2.1**	System error while accessing the patient's profile
		2.1.a Notify: *"Error accessing patient profile. Please try again later!"*
	3.1	Form submission error
		3.1.a Notify: *"Form submission error. Please try again later!"*
	4.1	Missing required information
		4.1.a Notify: *"Please fill in all required fields!"*
	5.1	System fails to update medical history
		5.1.a Notify: *"Failed to update medical history. Please try again!"*
Quality Requirements	• The medical history update process should be completed within 10 minutes. • The system must ensure the integrity and accuracy of the updated data. • Medical history updates must comply with healthcare data privacy and security regulations. • All changes should be logged for audit purposes, including timestamps and doctor details.	

Case Description-

14: View Patient Medical History

Use Case:	View Patient Medical History	
Goal:	Allow both patients and doctors to view the patient's medical history, including e-prescriptions and medical test results. Assistants may also view the medical history with the necessary permissions.	
Precondition:	The patient must have an existing profile with medical history in the system. Doctors and assistants must have appropriate permissions to view the patient's medical history.	
Success End Condition:	The patient's medical history is displayed successfully.	
Failed End Condition:	Notification: *"Failed to load medical history!"*	
Primary Actors: Secondary Actors:	Doctor, Patient Assistant	
Trigger	The patient, doctor, or assistant selects the "View Medical History" option.	
Description / Main Success Scenario	1.	The user (patient, doctor, or assistant) logs in and selects the "View Medical History" option from the patient's profile.
	2.	The system retrieves the patient's medical history, including e-prescriptions and medical test results.
	3.	The system displays the patient's medical history.
Alternative Flows	2.1	System error while retrieving medical history
		2.1.a Notify: *"Error retrieving medical history. Please try again later!"*
	3.1	Medical history data not found
		3.1.a Notify: *"No medical history available. Please check back after your consultation!"*
	3.2	Insufficient permissions to view medical history (assistant)
		3.2.a Notify: *"Access Denied. You do not have permission to view this medical history!"*
Quality Requirements	• The medical history should be displayed within 5 seconds. • The system must ensure that only authorized users (patients, doctors, assistants) can view the medical history. • The medical data must be up-to-date, accurate, and comply with healthcare data privacy standards.	

Case Description-

15: Video Conferencing

Use Case:	Video Conferencing	
Goal:	Allow patients to schedule and conduct video consultations with doctors within the system.	
Precondition:	Both the patient and doctor must have active profiles in the system. The patient must schedule a video consultation with the doctor in advance.	
Success End Condition:	The video consultation is successfully conducted.	
Failed End Condition:	Notification: *"Video Conferencing Failed!"*	
Primary Actors: Secondary Actors:	Doctor, Patient None	
Trigger	The scheduled time for the video consultation begins, and the patient or doctor initiates the video conference.	
Description / Main Success Scenario	1.	The patient schedules a video consultation with a doctor through the system.
	2.	At the scheduled time, the patient and doctor log in and access the "Video Conferencing" feature.
	3.	The system initiates the video conference connection between the patient and doctor.
	4.	The patient and doctor conduct the video consultation.
	5.	Upon conclusion, both parties end the video call.
Alternative Flows	2.1	Doctor or patient fails to join the video call on time
		2.1.a Notify: *"The other party has not joined yet. Please wait!"*
	3.1	System error while initiating the video call
		3.1.a Notify: *"Video conferencing error. Please try again!"*
		Video quality or connection issues during the consultation
	4.1	**4.1.a** Notify: *"Connection unstable. Please check your internet connection!"*
	5.1	System fails to end the video conference
		5.1.a Notify: *"Error ending the video call. Please try again later!"*

Case Description-

Quality Requirements	• The video call should begin within 10 seconds after both participants have joined. • The system must ensure secure and encrypted video communication in compliance with healthcare data privacy regulations. • The system should provide clear video and audio quality, with automatic reconnection in case of network disruptions. • All video consultations should be logged for audit purposes, with timestamps and participants' details.

16: Make Payment

Use Case:	Make Payment	
Goal:	Allow patients to make payments for consultations or medical services through the system.	
Precondition:	The patient must be logged in and have a consultation or medical service for which payment is required.	
Success End Condition:	The payment is processed successfully, and a confirmation receipt is generated.	
Failed End Condition:	Notification: *"Payment failed!"*	
Primary Actors: Secondary Actors:	Patient None	
Trigger	The patient selects the option to make a payment after a consultation or medical service.	
Description / Main Success Scenario	1.	The patient logs in and navigates to the "Payments" section.
	2.	The patient selects a consultation or service to pay for and clicks on the "Make Payment" button.
	3.	The system displays the list of outstanding payments for consultations or medical services.
	4.	The system presents payment options (credit/debit card, mobile wallet, etc.).
	5.	The patient enters payment details and confirms the transaction.
	6.	The system processes the payment and displays a notification: *"Payment successful!"*
	7.	The system generates a payment receipt, which the patient can download or view.
Alternative Flows	2.1	No outstanding payments
		2.1.a Notify: *"No payments due at this time!"*
	4.1	Invalid payment details entered
		4.1.a Notify: *"Please check your payment details and try again!"*

Case Description-

	5.1	Payment processing error
		5.1.a Notify: *"Payment failed. Please try again later!"*
Quality Requirements	• The payment process should be completed within 2 minutes. • The system must ensure secure and encrypted processing of payment information in compliance with financial and healthcare privacy regulations. • The system must provide a detailed transaction history for patients to review past payments. • All payment transactions should be logged for audit and support purposes.	

17: Payment Confirmation

Use Case:	Payment Confirmation	
Goal:	Notify patients of successful payments and provide confirmation details. The system also logs the payment for administrative purposes.	
Precondition:	The patient must have successfully completed a payment transaction. The payment details must be logged in the system.	
Success End Condition:	The patient receives a confirmation of the payment, and the system logs the payment for the admin.	
Failed End Condition:	Notification: *"Payment confirmation failed!"*	
Primary Actors: Secondary Actors:	Patient Admin	
Trigger	The system completes the payment process and generates a confirmation notification.	
Description / Main Success Scenario	1.	The patient completes the payment process successfully.
	2.	The patient can view or download the payment confirmation receipt from the system.
	3.	The system sends a notification to the patient, confirming the payment with details (e.g., amount, transaction ID, date).
	4.	The system logs the payment in the admin panel for review and record-keeping.
	5.	The system verifies the transaction and generates a payment confirmation message.
Alternative Flows	2.1	System error during confirmation process
		2.1.a Notify: *"Payment confirmation failed. Please contact support!"*
	3.1	Confirmation not received by patient

Case Description-

		3.1.a Notify: *"Unable to send confirmation. Please check your contact information!"*
	4.1	Admin fails to access payment records
		4.1.a Notify: *"Payment log failed. Please try again later!"*
Quality Requirements	• The confirmation notification should be sent to the patient within 10 seconds of successful payment. • Payment confirmation details must include the transaction ID, amount, and timestamp, and be accessible from the patient's account for future reference. • The system should ensure that both the patient and admin can view the payment history securely, following financial data protection regulations.	

18: Request Complaints

Use Case:	Request Complaints	
Goal:	Allow patients and doctors to submit complaints regarding their experiences or issues encountered while using the system.	
Precondition:	The patient or doctor must be logged into the system with an active account.	
Success End Condition:	The complaint is successfully submitted, and a notification is sent to confirm the complaint has been logged.	
Failed End Condition:	Notification: *"Failed to submit complaint!"*	
Primary Actors: Secondary Actors:	Patient, Doctor Admin	
Trigger	The patient or doctor selects the "Submit Complaint" option to report an issue or experience.	
Description / Main Success Scenario	1.	The patient or doctor logs in and navigates to the "Submit Complaint" section.
	2.	The system provides a form for the user to describe the issue, select a category, and provide any relevant details.
	3.	The user fills out the form and clicks "Submit."
	4.	The system logs the complaint and sends a notification: *"Complaint submitted successfully!"*
	5.	The complaint is forwarded to the admin for review and further action.

Case Description-

<table>
<tr><td>Alternative Flows</td><td><table>
<tr><td>2.1</td><td>System error while accessing the complaint form</td></tr>
<tr><td></td><td>2.1.a Notify: "Error loading complaint form. Please try again later!"</td></tr>
<tr><td>41</td><td>User fails to provide required details</td></tr>
<tr><td></td><td>4.1.a Notify: "Please complete all required fields!"</td></tr>
<tr><td>5.1</td><td>System fails to log or forward the complaint</td></tr>
<tr><td></td><td>5.1.a Notify: "Failed to submit complaint. Please try again later!"</td></tr>
</table></td></tr>
<tr><td>Quality Requirements</td><td>• The complaint submission process should be completed within 3 minutes.
• The system must ensure that all complaints are forwarded to the admin panel for review and action.
• Complaint details must be securely stored, and the system must allow users to track the status of their complaints.
• The system should ensure anonymity if the user requests it, in compliance with privacy regulations.</td></tr>
</table>

Case Description-19: View Complaints

Use Case:	View Complaints
Goal:	Allow administrators to view and manage all filed complaints from patients and doctors.
Precondition:	The administrator must be logged in with the necessary permissions to access the complaints management module. Complaints must have been previously submitted by patients or doctors.
Success End Condition:	The administrator successfully views and manages the complaints.
Failed End Condition:	Notification: *"Failed to retrieve complaints!"*
Primary Actors: Secondary Actors:	Admin Patient, Doctor
Trigger	The administrator selects the "View Complaints" option from the system dashboard.
Description / Main Success Scenario	1. The administrator logs in and navigates to the "Complaints Management" section. 2. The system retrieves and displays a list of all filed complaints. 3. The administrator selects a complaint to view the details (e.g., description, submitter, date, category). 4. The administrator reviews the complaint and takes action (e.g., marks it as resolved, forwards it for investigation, or contacts the submitter). 5. The system updates the status of the complaint and logs the action taken.
Alternative Flows	2.1 System error while retrieving complaints 2.1.a Notify: *"Error retrieving complaints. Please try again later!"* 3.1 No complaints found 3.1.a Notify: *"No complaints available at this time!"* 4.1 System fails to update complaint status 4.1.a Notify: *"Failed to update complaint. Please try again later!"*

Case Description-

Quality Requirements	• The complaint list should load within 5 seconds. • The system should allow administrators to filter complaints by status (open, resolved), date, and submitter (patient or doctor). • All actions taken by the administrator should be logged for auditing and record-keeping purposes. • The system must ensure privacy and confidentiality when handling complaint details, in compliance with data protection regulations.

20: Create Data Report

Use Case:	Create Data Report
Goal:	Allow system administrators to generate reports based on system usage data or medical activities (e.g., consultations, prescriptions, patient interactions).
Precondition:	The administrator must be logged in with the necessary permissions to create and access data reports.
Success End Condition:	The data report is successfully generated and available for download or viewing.
Failed End Condition:	Notification: *"Failed to create data report!"*
Primary Actors: Secondary Actors:	Admin None
Trigger	The administrator selects the "Create Data Report" option from the system dashboard.
Description / Main Success Scenario	1. The administrator logs in and navigates to the "Reports" section. 2. The system presents options to generate reports based on usage data or medical activities (e.g., consultations, prescriptions, patient activity). 3. The administrator selects the type of report, sets parameters (e.g., date range, type of activity), and customizes the report. 4. The administrator clicks "Generate Report." 5. The system processes the data and generates the report. 6. The system displays the report and provides the option to download it in various formats (e.g., PDF, Excel).

Case Description-

Alternative Flows	

2.1	System error while accessing the report creation module
	2.1.a Notify: *"Error accessing the report module. Please try again later!"*
4.1	Insufficient data or incorrect criteria for report generation
	4.1.a Notify: *"No data available for the selected criteria!"*
5.1	System fails to generate the report
	5.1.a Notify: *"Failed to generate the report. Please try again!"*

Quality Requirements	• The report generation process should be completed within 30 seconds, depending on the volume of data. • The system must allow administrators to generate customizable reports based on various filters (e.g., date range, activity type). • The system must maintain the security and confidentiality of sensitive data used in the reports.

21: Update Data Report

Use Case:	Update Data Report
Goal:	Allow system administrators to update existing data reports by modifying filters, parameters, or including new data.
Precondition:	The administrator must be logged in with the necessary permissions to update data reports. An existing report must be available for editing.
Success End Condition:	The data report is successfully updated with the new parameters or data.
Failed End Condition:	Notification: *"Failed to update data report!"*
Primary Actors: Secondary Actors:	Admin None
Trigger	The administrator selects an existing report for updating.
Description / Main Success Scenario	

1.	The administrator logs in and navigates to the "Reports" section.
2.	The system presents a list of existing reports.
3.	The administrator selects a report to update.
4.	The system displays the report, allowing the administrator to modify parameters (e.g., date range, data type, activity type).
5.	The administrator applies the updates and clicks "Save."

Case Description-

	6. The system processes the changes and updates the report.
Alternative Flows	2.1 System error while retrieving the list of reports 2.1.a Notify: *"Error retrieving reports. Please try again later!"* 3.1 No report available for update 3.1.a Notify: *"No report found for update!"* 5.1 System fails to apply the updates 5.1.a Notify: *"Failed to update report. Please try again!"*
Quality Requirements	• The report update process should be completed within 30 seconds, depending on the data size and complexity. • The system must ensure only authorized administrators can modify reports. • All changes to reports should be logged for auditing, including the admin responsible for the update. • The system should support report export in various formats (e.g., PDF, Excel) after the update is completed.

22: View Data Report

Use Case:	View Data Report
Goal:	Allow system administrators to view data reports for insights into system usage, medical activities, and overall performance.
Precondition:	The administrator must be logged in with the necessary permissions to access and view data reports. Data reports must already exist in the system.
Success End Condition:	The administrator successfully views the selected data report.
Failed End Condition:	Notification: *"Failed to load data report!"*
Primary Actors: Secondary Actors:	Admin None
Trigger	The administrator selects a report to view from the system dashboard.
Description / Main Success Scenario	1. The administrator logs in and navigates to the "Reports" section. 2. The system displays a list of available data reports.

Case Description-

	3.	The administrator selects a specific report to view.
	4.	The system retrieves the report and displays it, showing relevant data on system usage, performance metrics, medical activities, etc.
	5.	The administrator can view, filter, or search within the report as needed.
Alternative Flows	2.1	System error while retrieving reports
		2.1.a Notify: *"Error retrieving reports. Please try again later!"*
	3.1	No reports available to view
		3.1.a Notify: *"No reports available. Please generate a report first!"*
Quality Requirements	• The selected report should load within 5 seconds. • The system must allow filtering, sorting, and searching within the report for detailed insights. • Only authorized administrators should have access to view reports.	

3.3 DFD Level 0 & 1

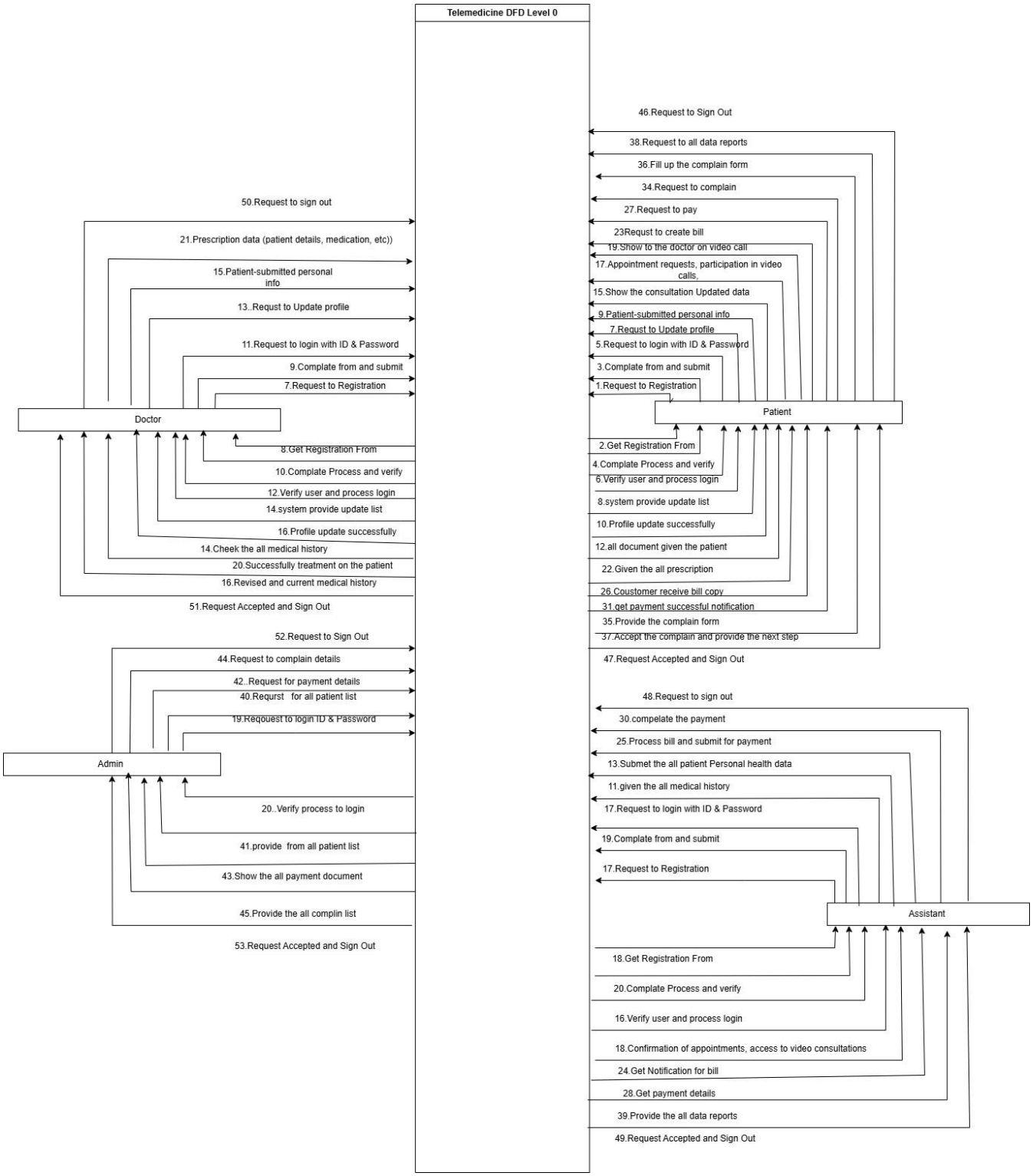


Figure 3: DFD Level 0

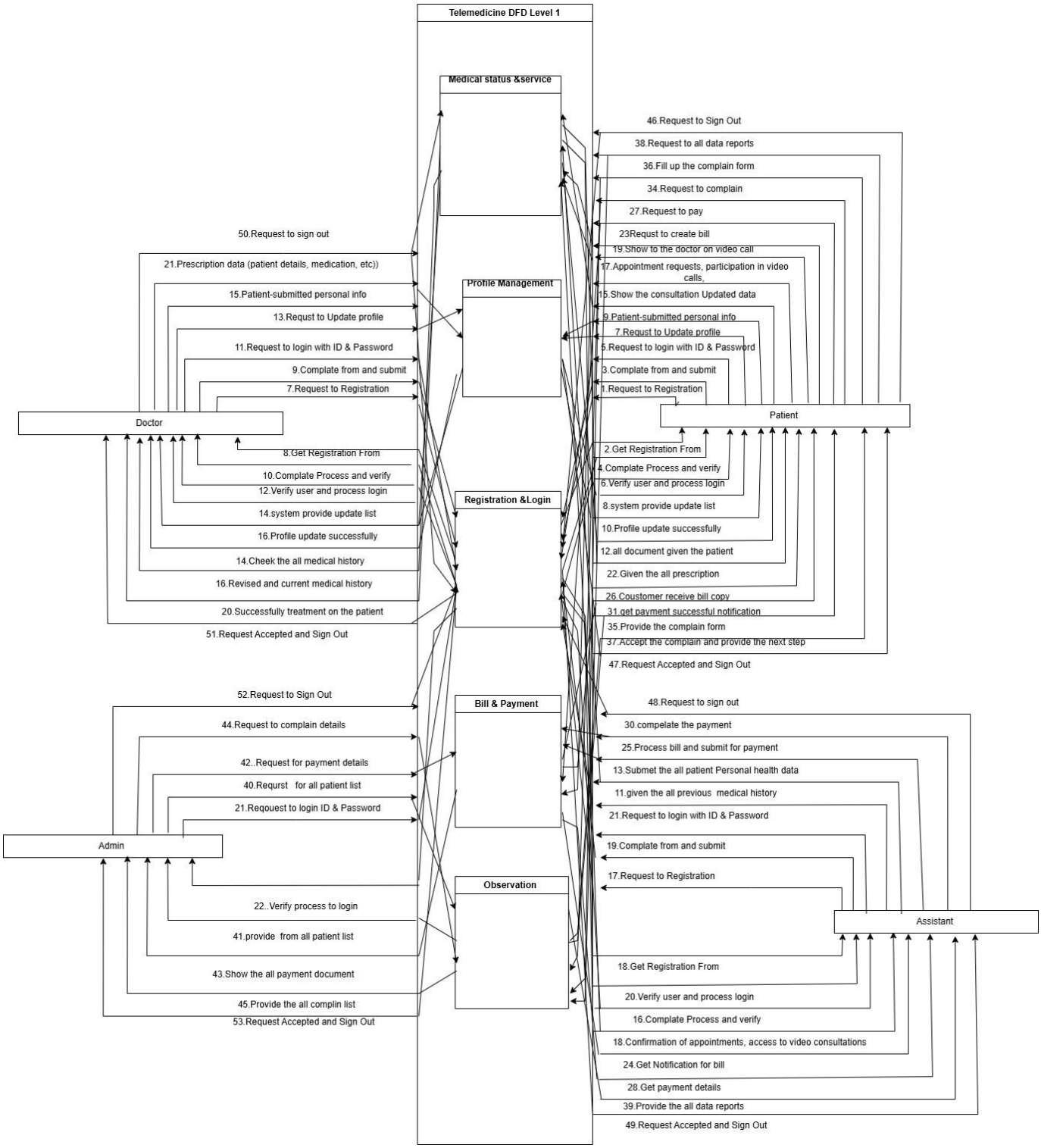


Figure 4: DFD Level 1

3.4 Activity Diagram

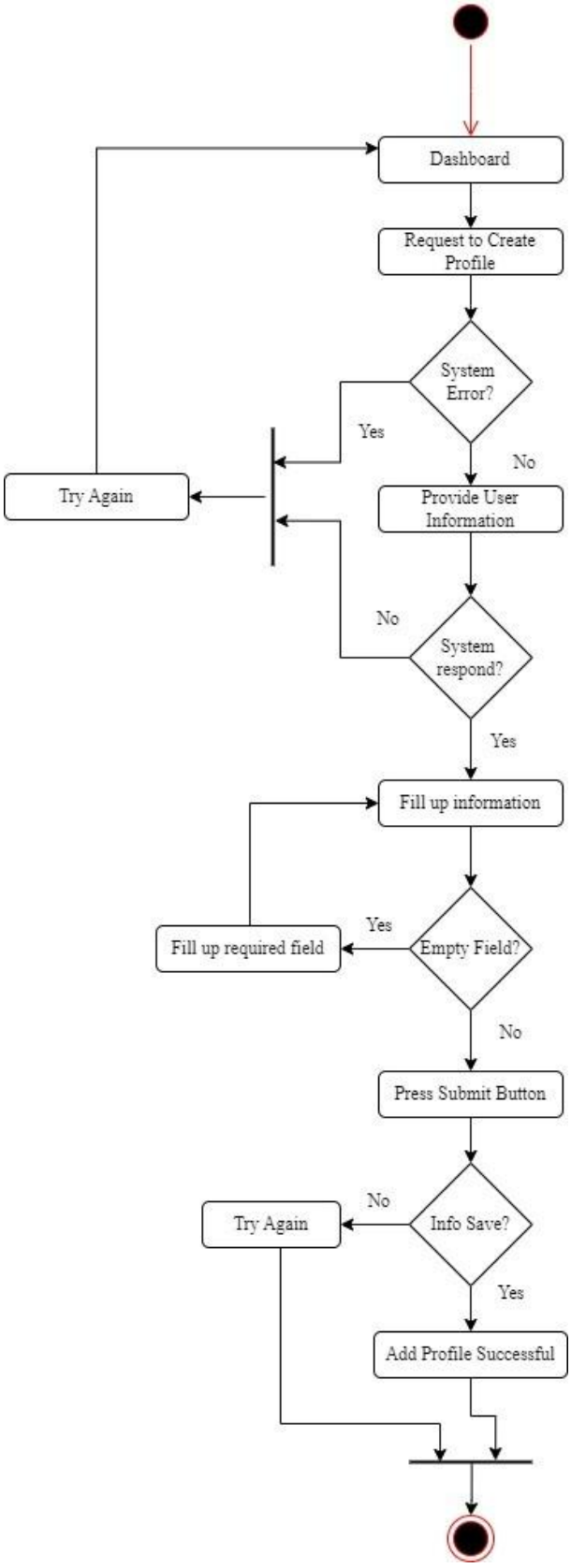


Figure 5: Activity Diagram- Create Profile

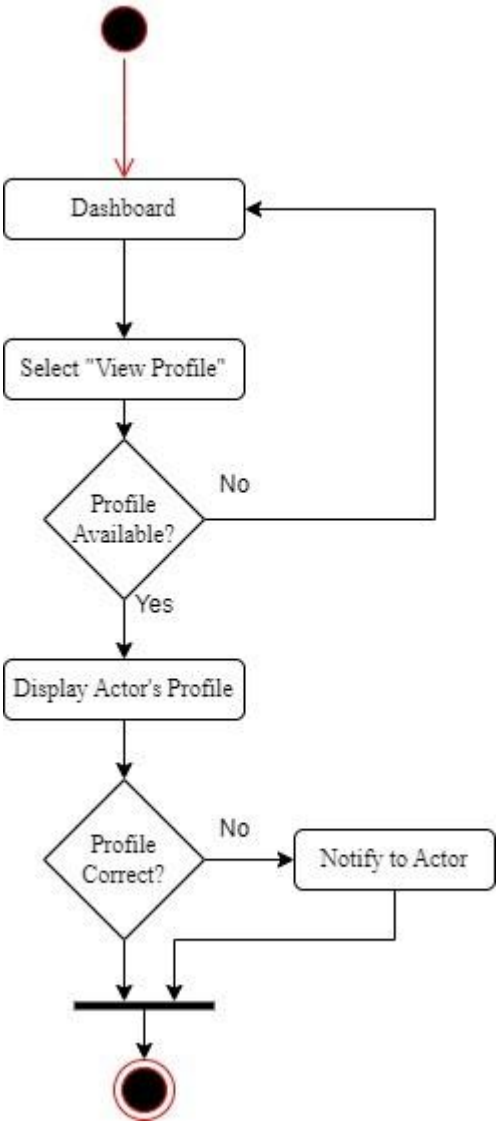


Figure 6: Activity Diagram- View Profile

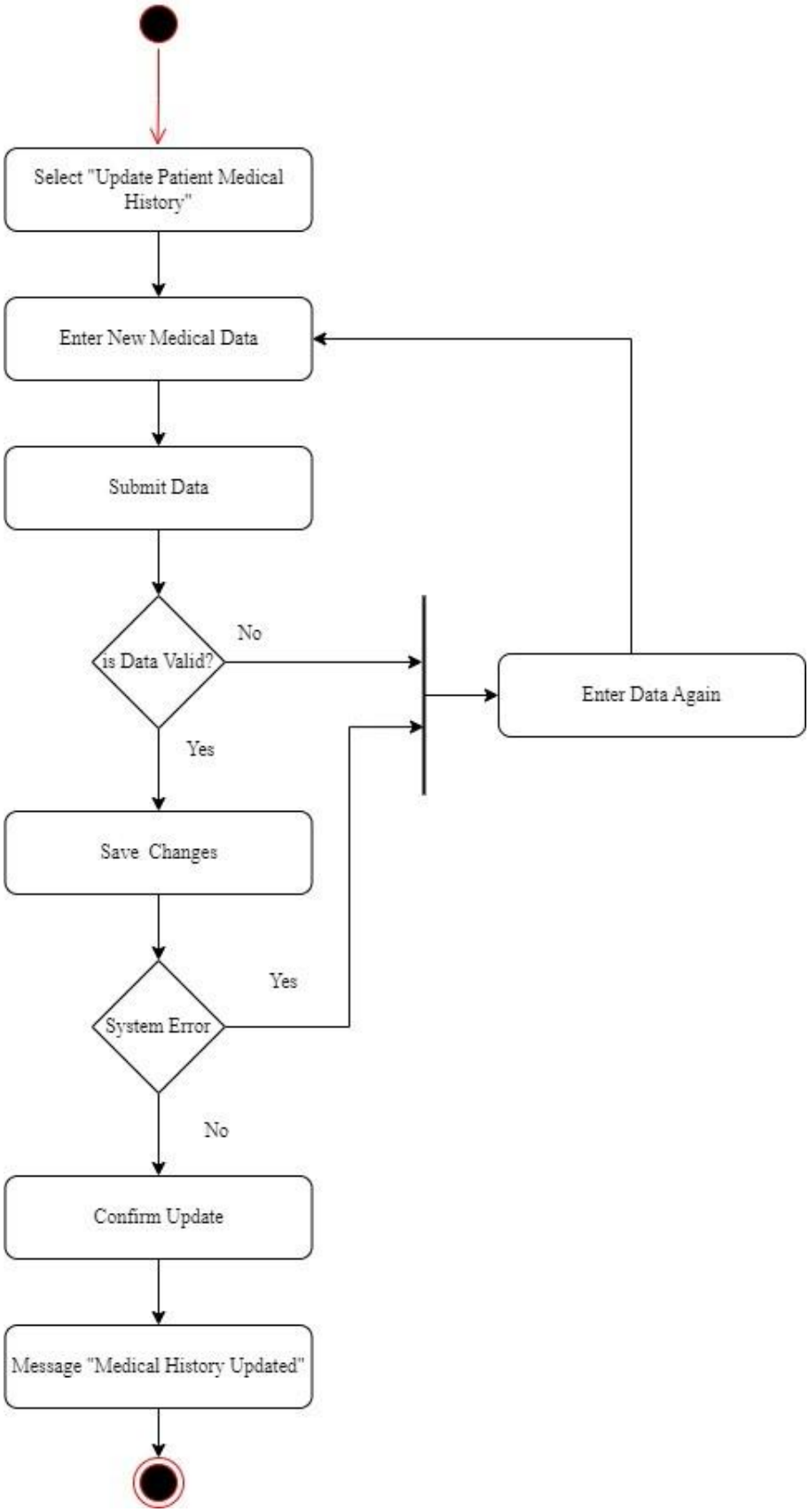


Figure 7: Activity Diagram- Update Patient Medical History

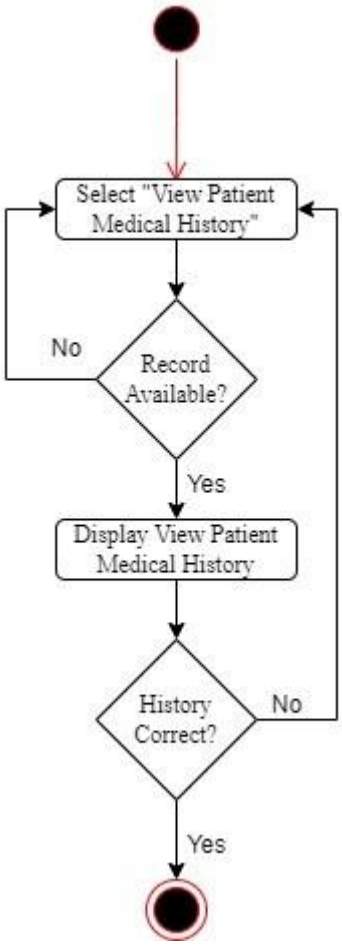


Figure 8: Activity Diagram- View Patient Medical History

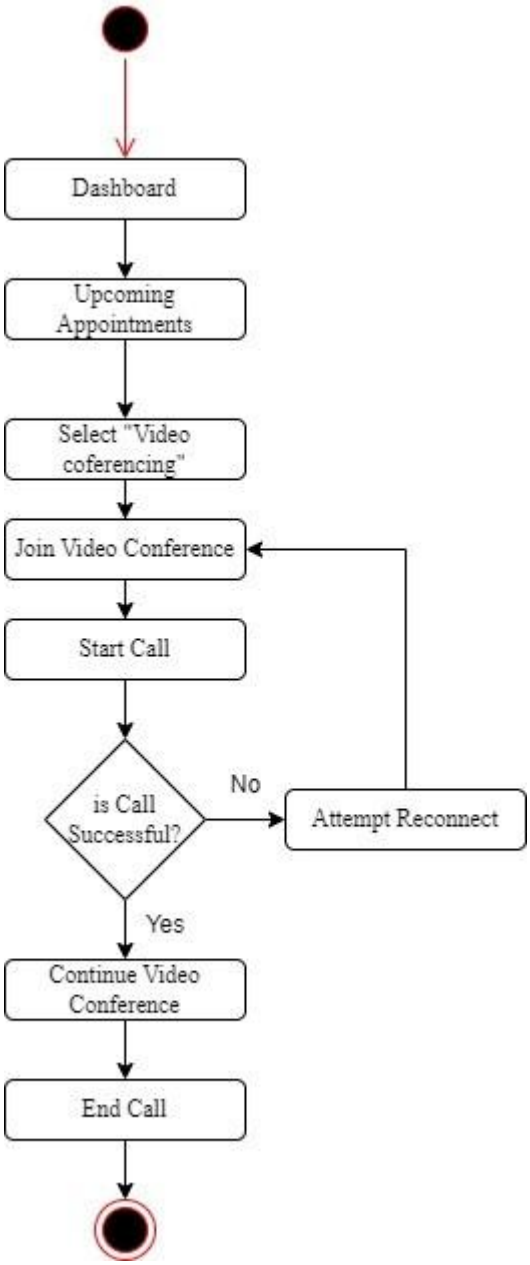


Figure 9: Activity Diagram- Video Conferencing

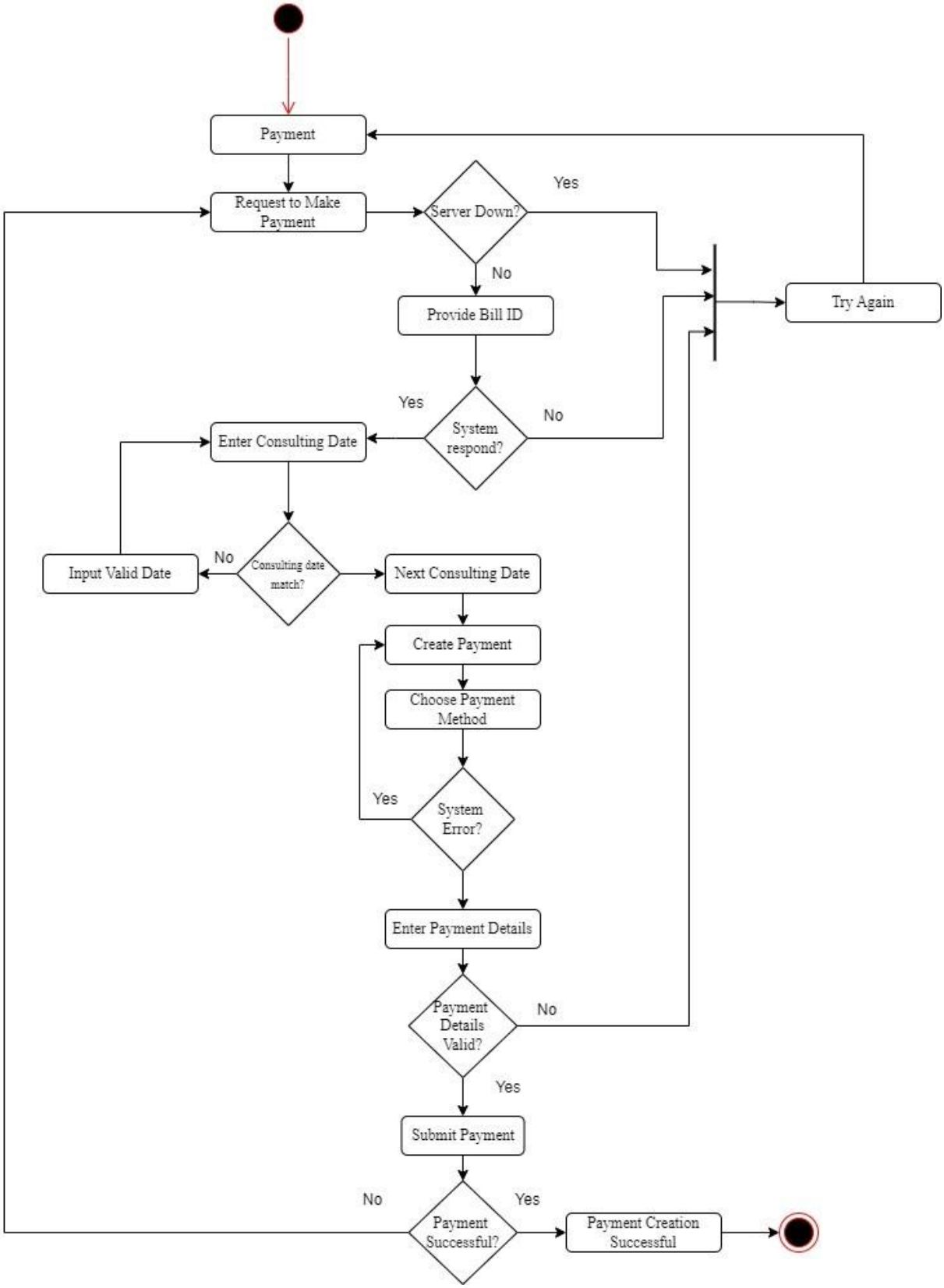


Figure 10: Activity Diagram- Make Payment

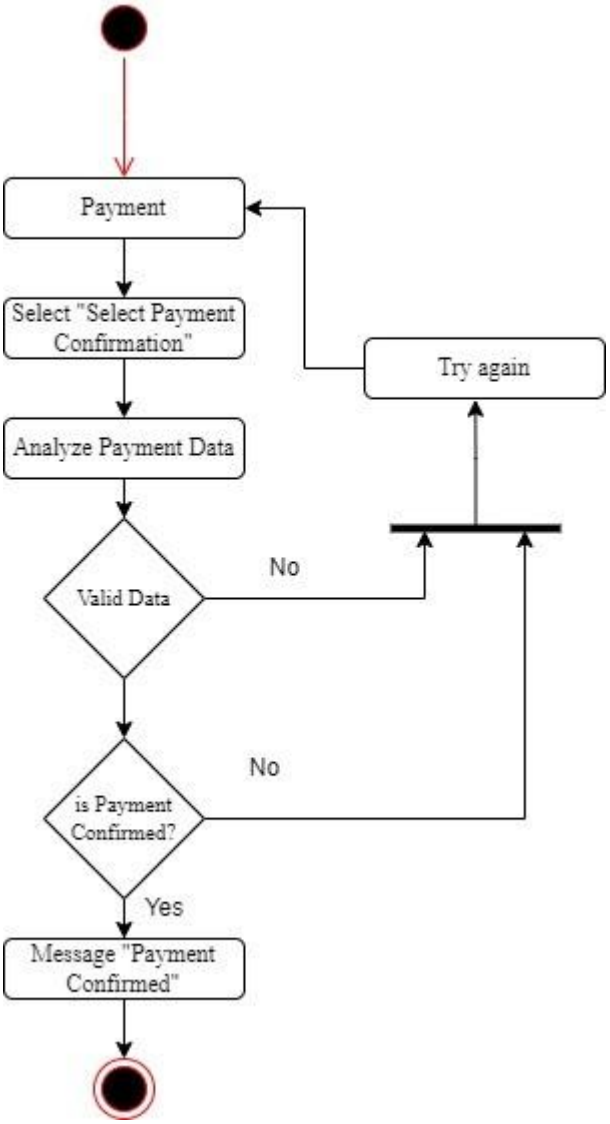


Figure 11: Activity Diagram- Confirm Payment

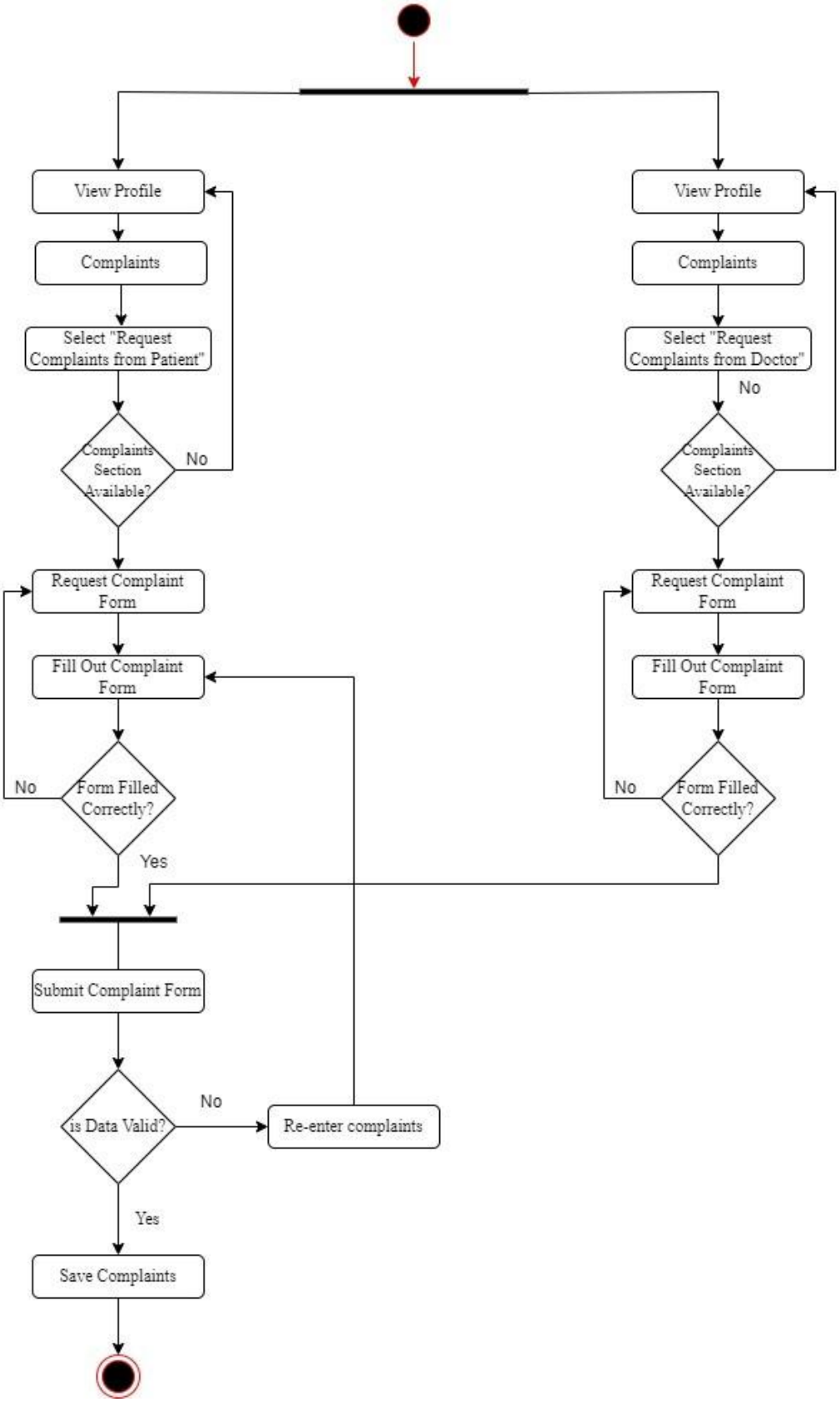


Figure 12: Activity Diagram- Request Complaints

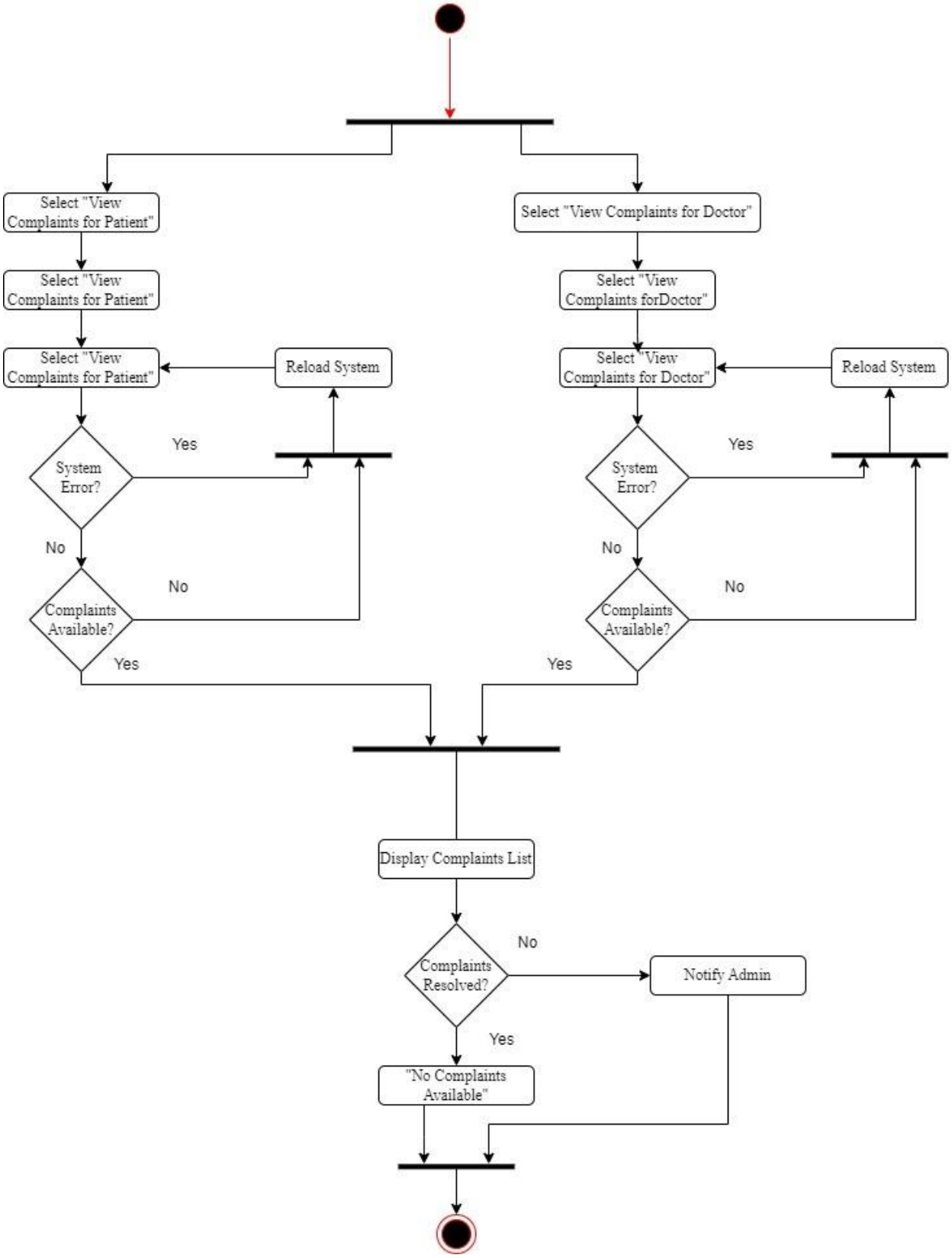


Figure 13: Activity Diagram- View Complaints

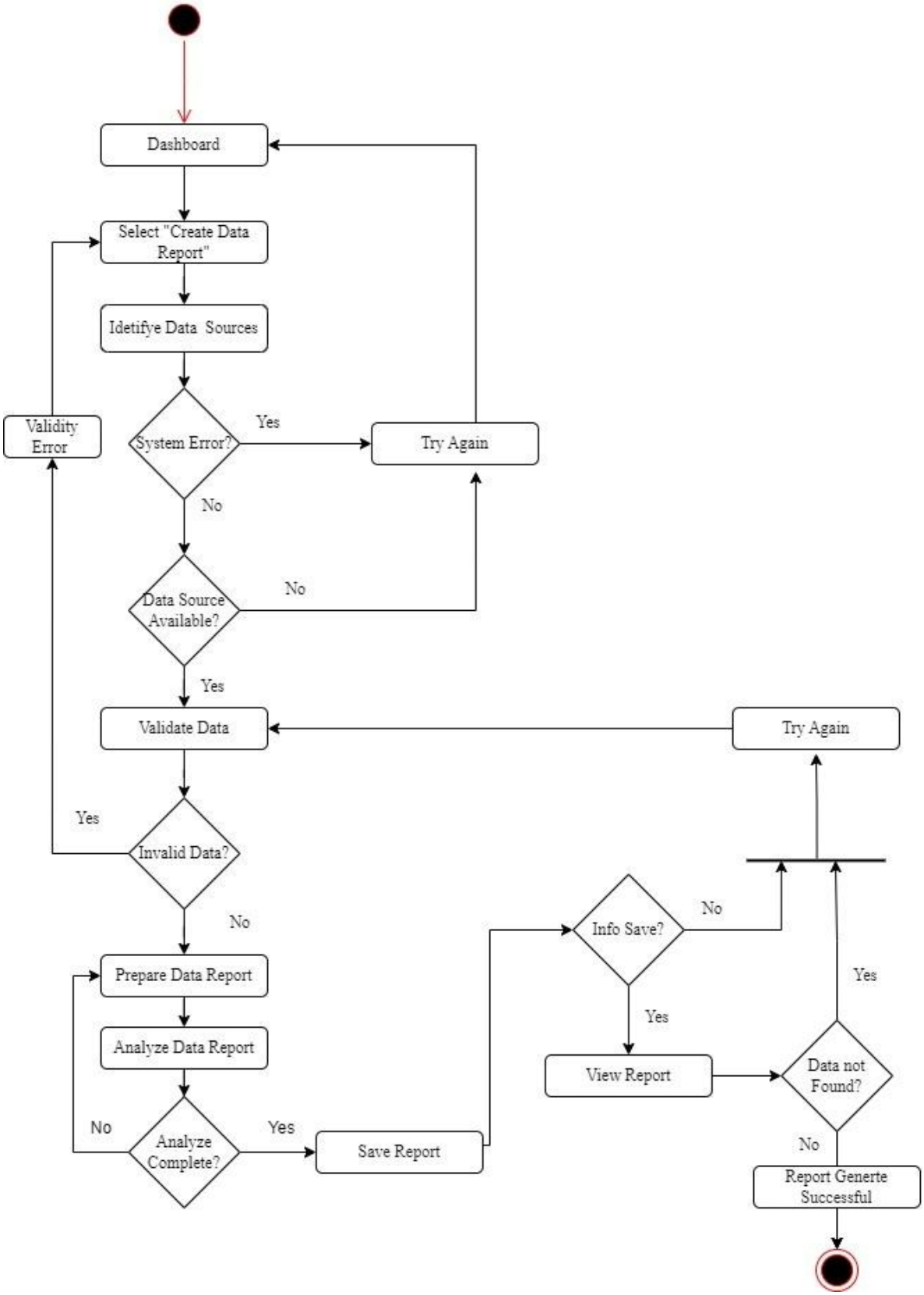


Figure 14: Activity Diagram- Create Data Report

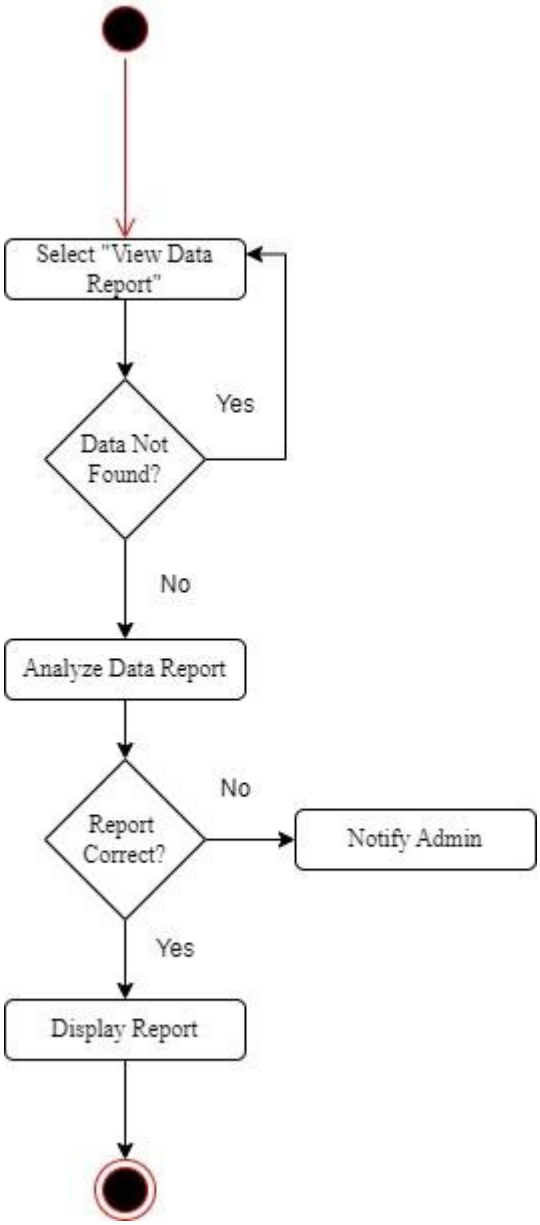


Figure 15: Activity Diagram- View Data Report

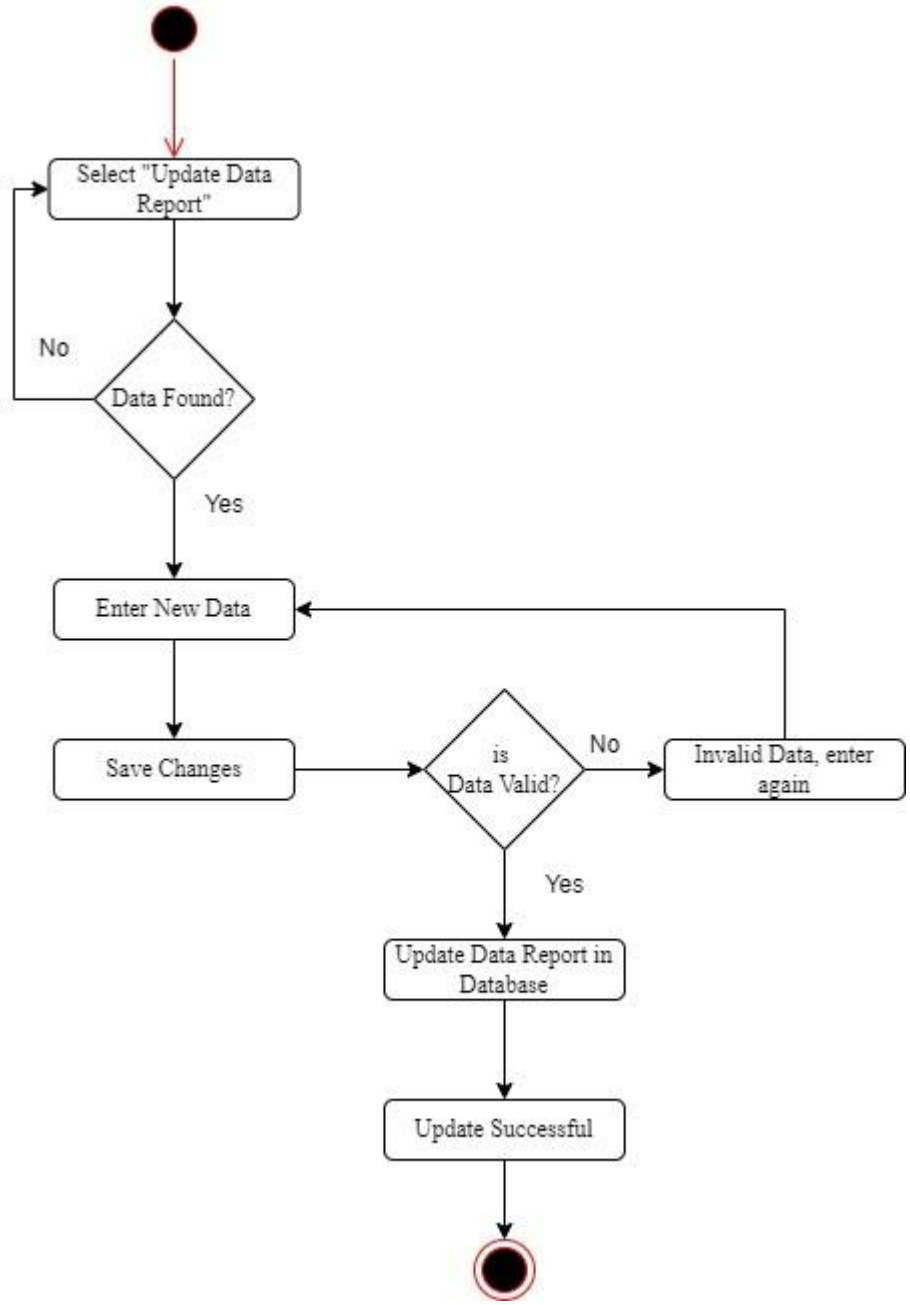


Figure 16: Activity Diagram- Update Data Report

3.5 State Diagrams

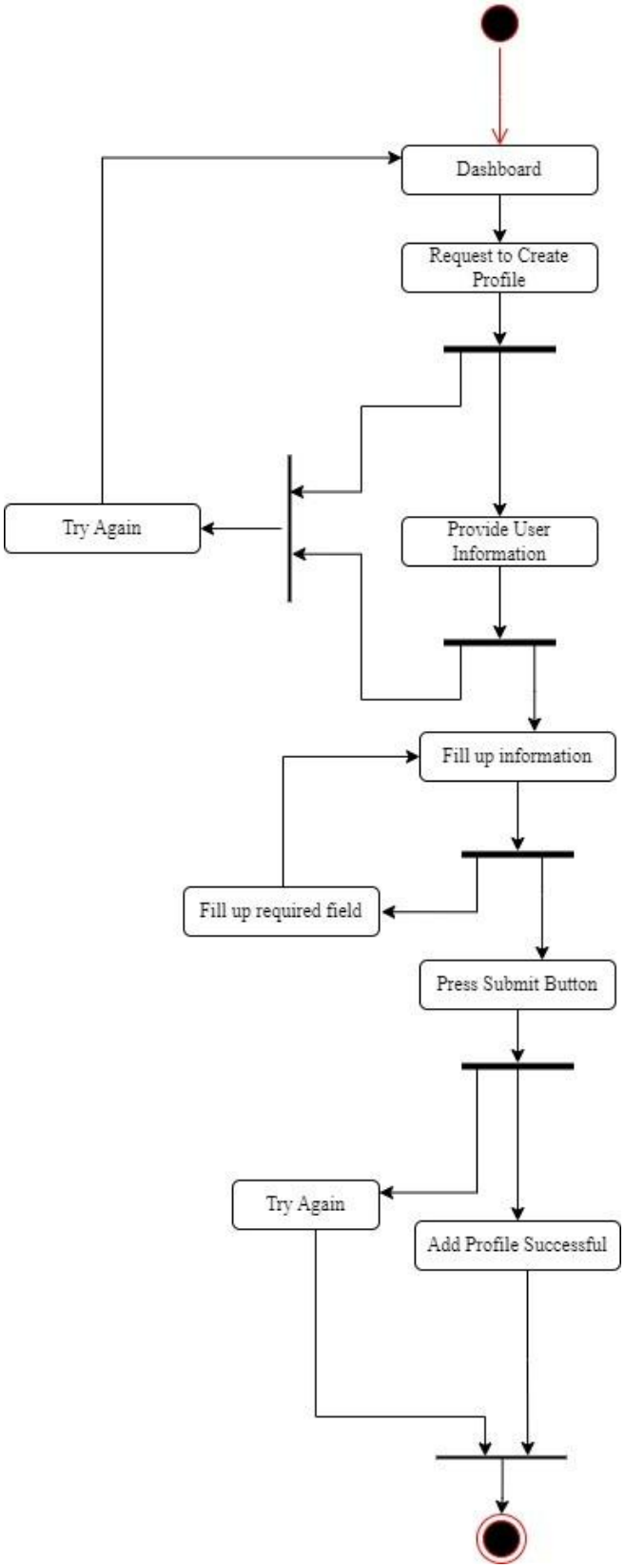


Figure 17: State Diagram- Create Profile

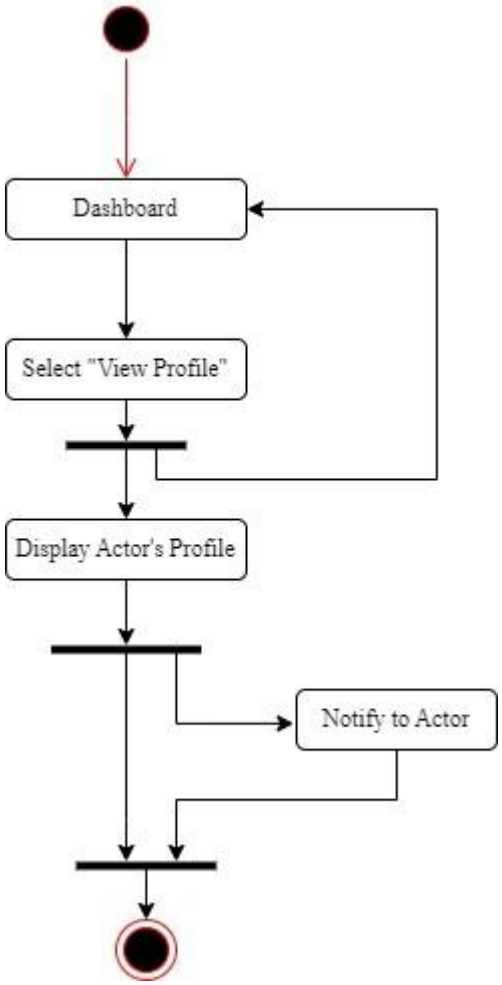


Figure 18: State Diagram- View Profile

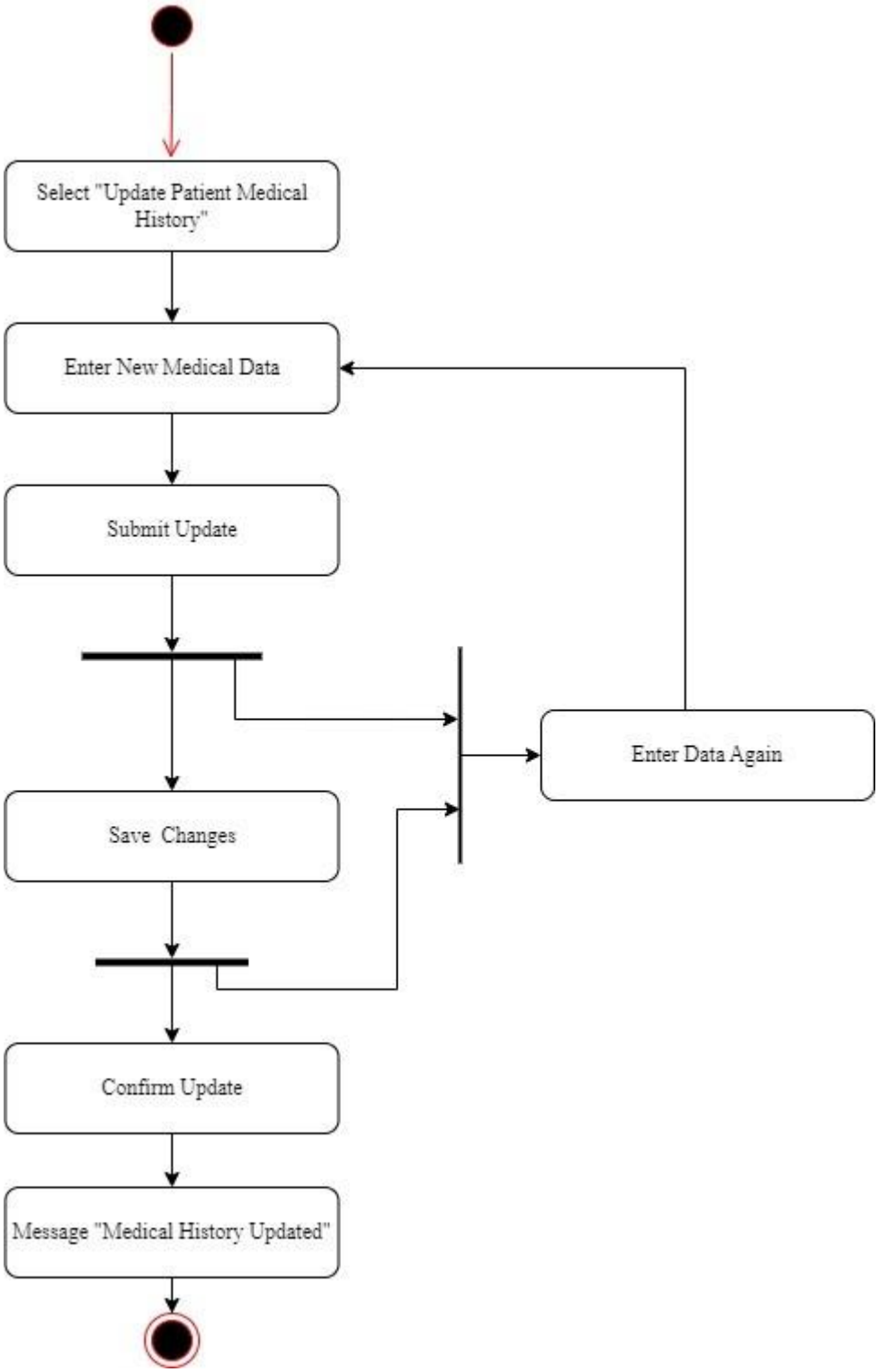


Figure 19: State Diagram- Update Patient Medical History

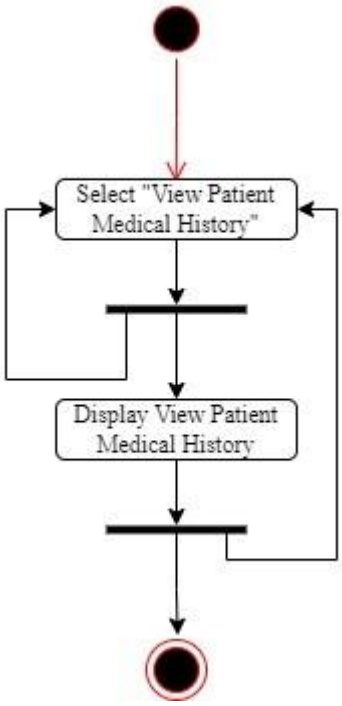


Figure 20: State Diagram- View Patient Medical History

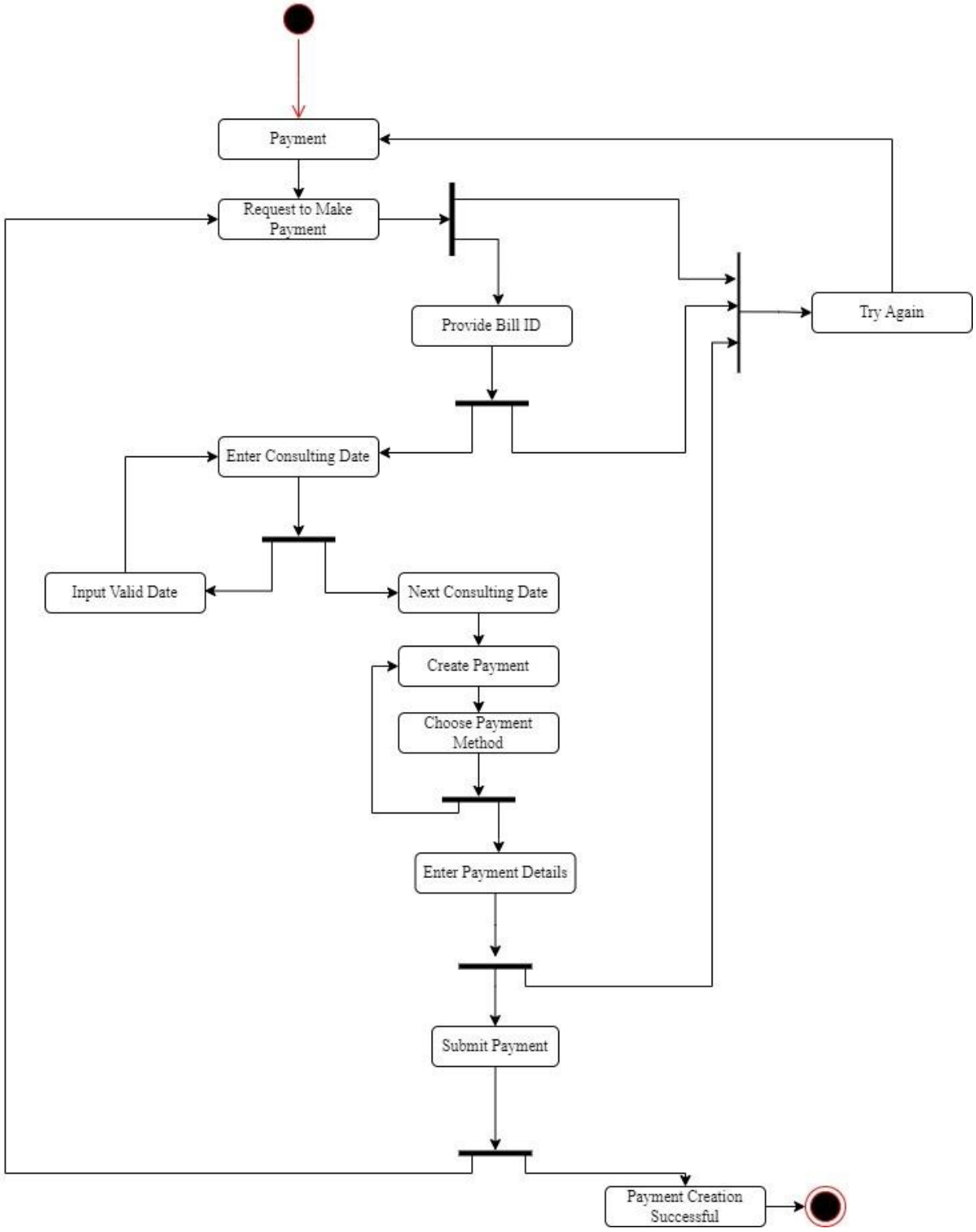


Figure 21: State Diagram- Make Payment

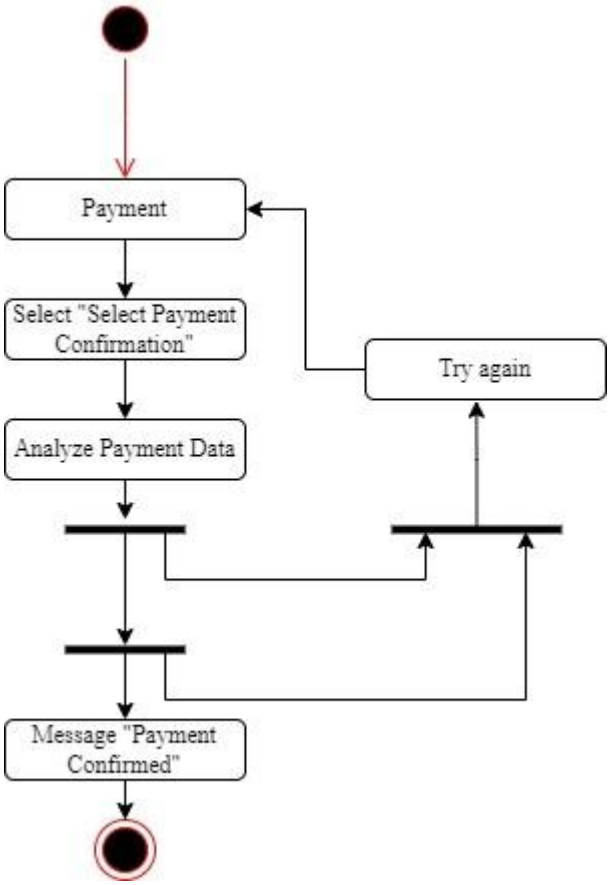


Figure 22: State Diagram- Payment Confirmation

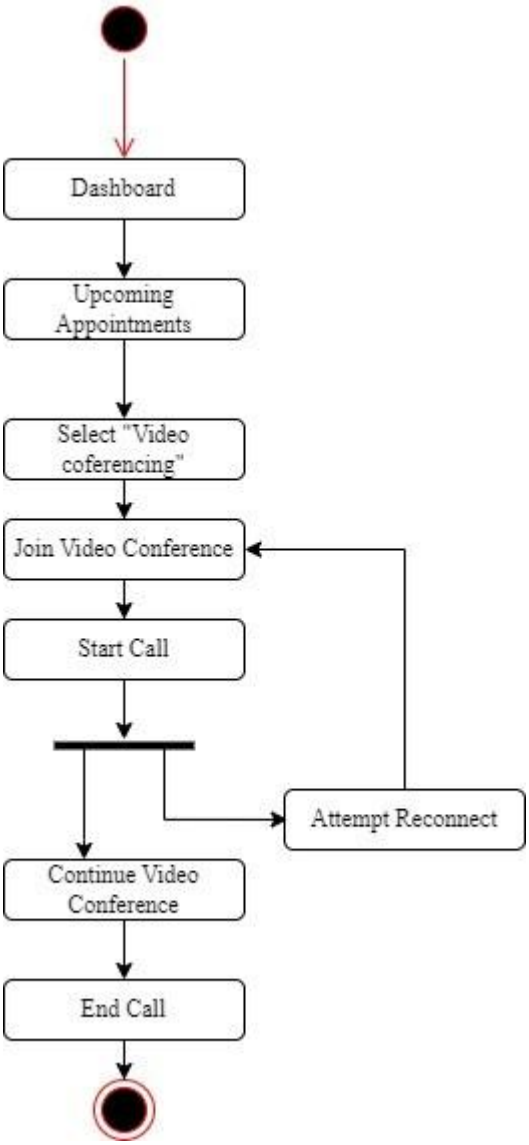


Figure 23: State Diagram- Video Conferencing

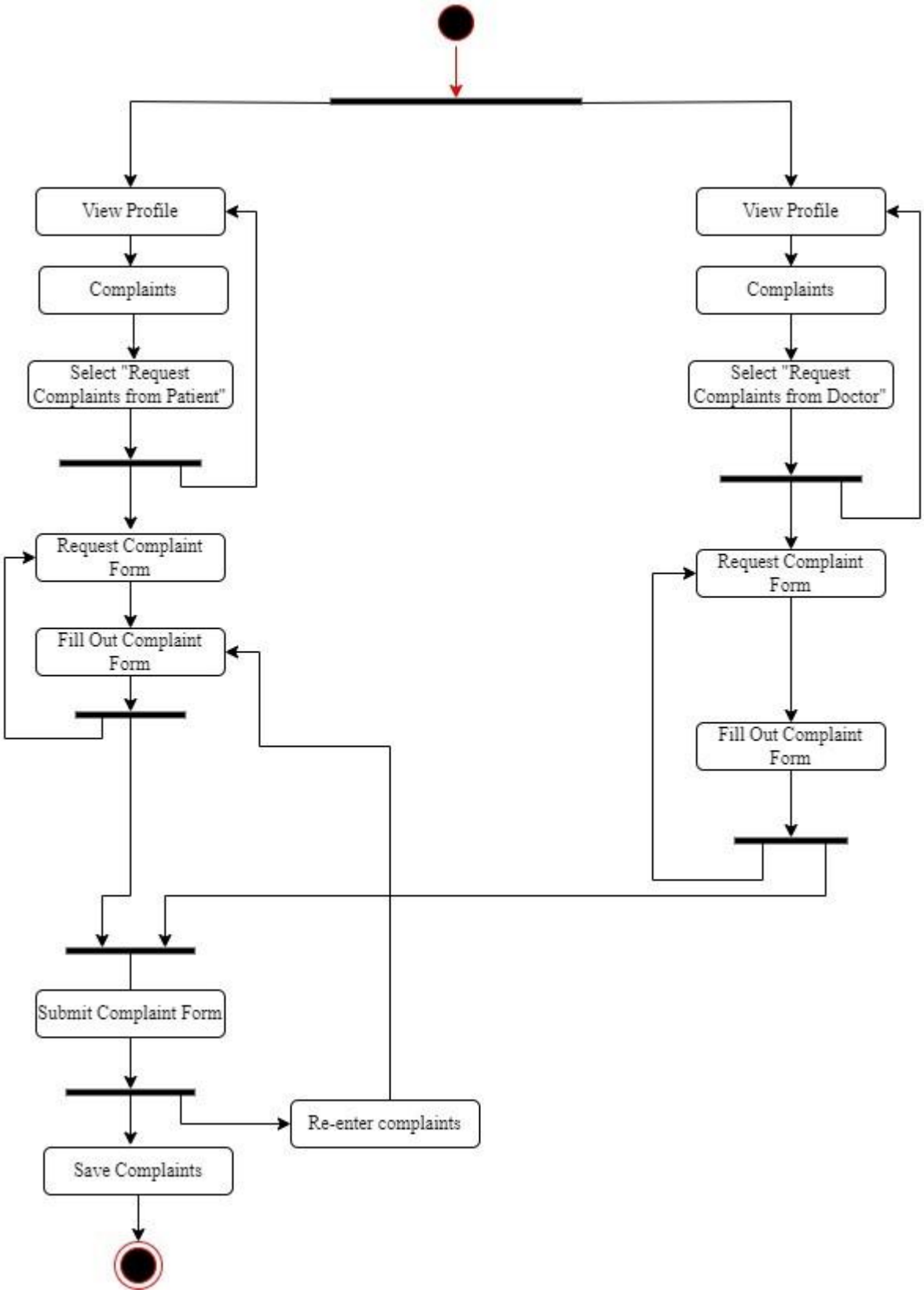


Figure 24: State Diagram- Request Complaints

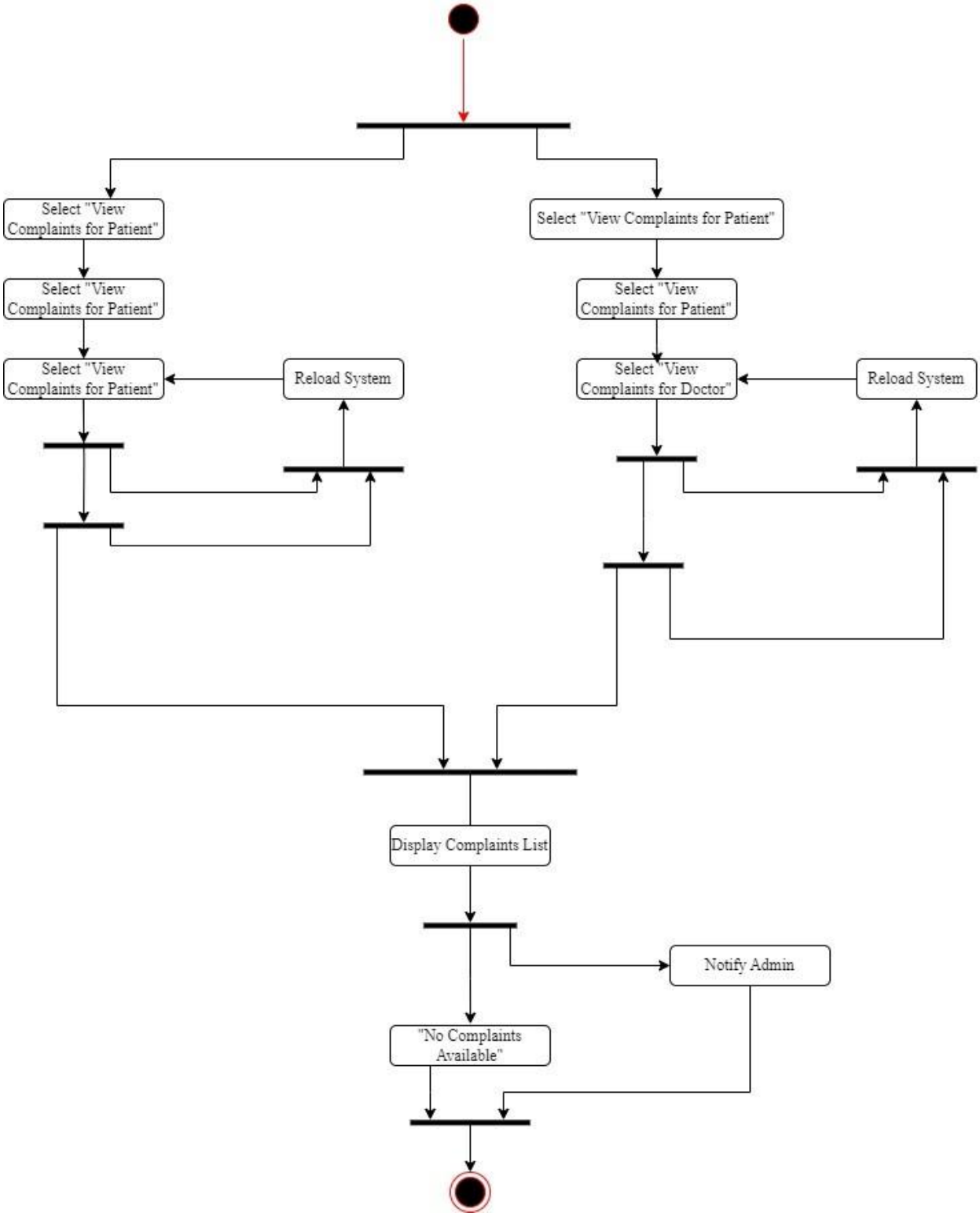


Figure 25: State Diagram- View Complaints

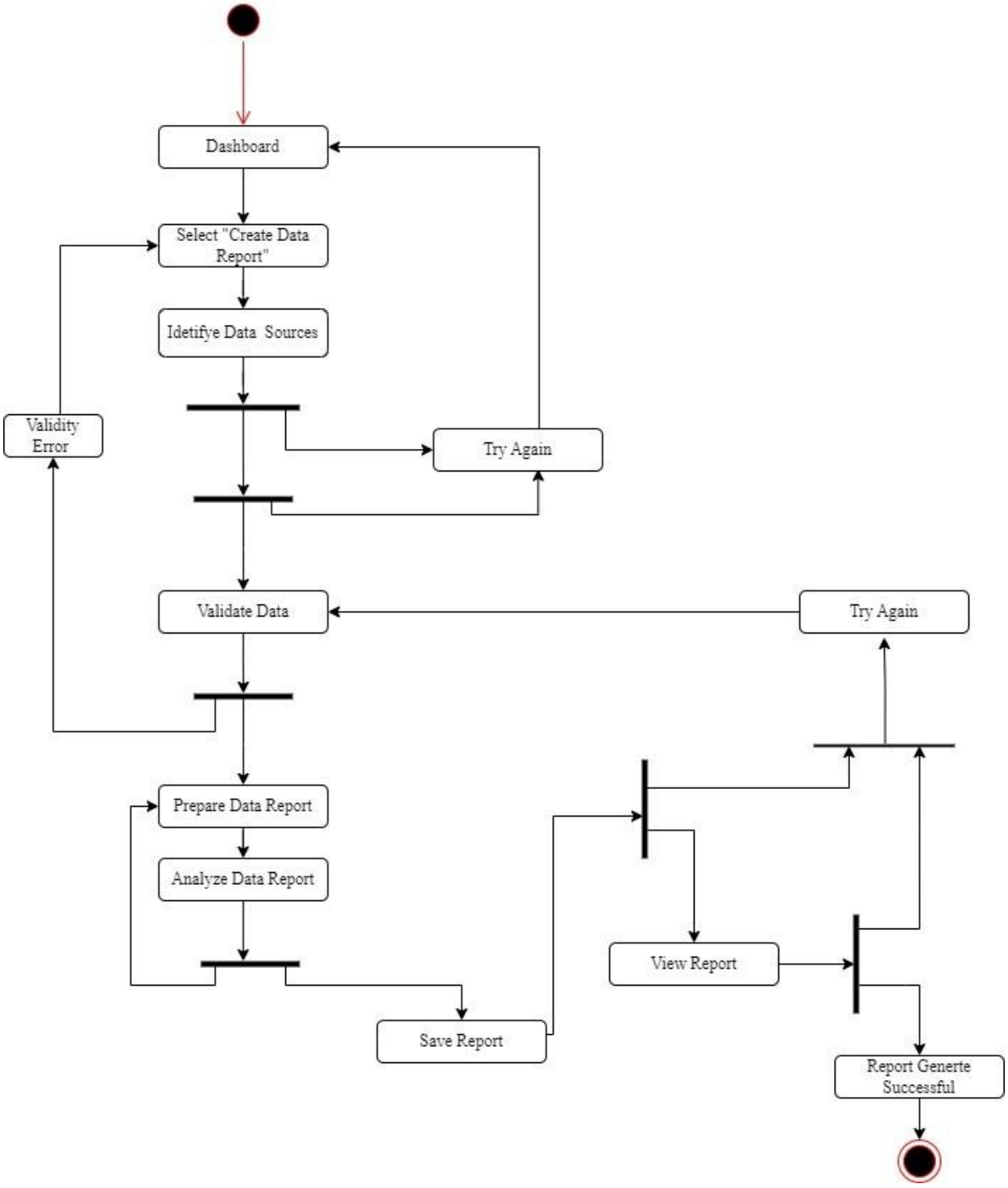


Figure 26: State Diagram- Create Data Report

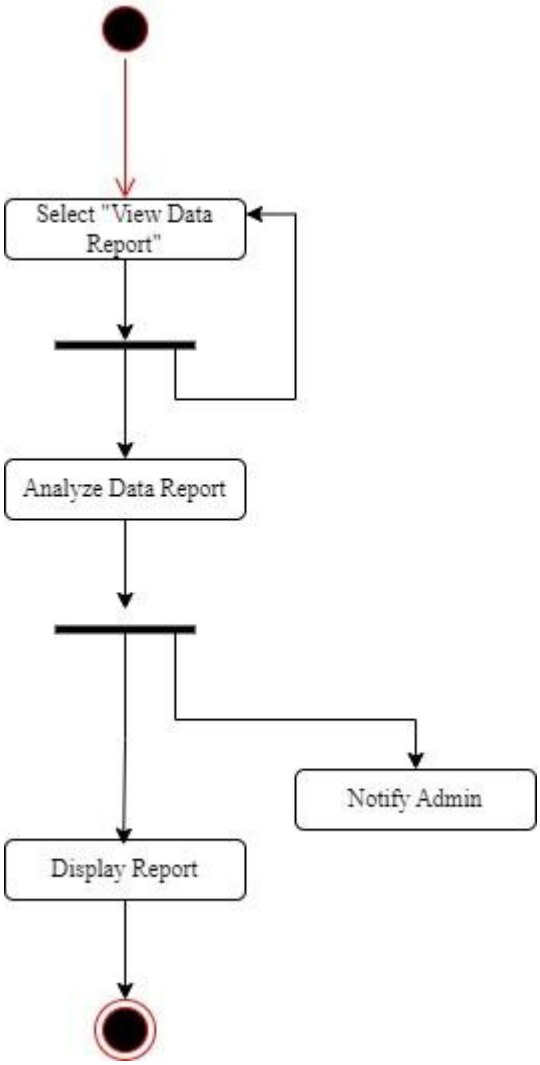


Figure 27: State Diagram- View Data Report

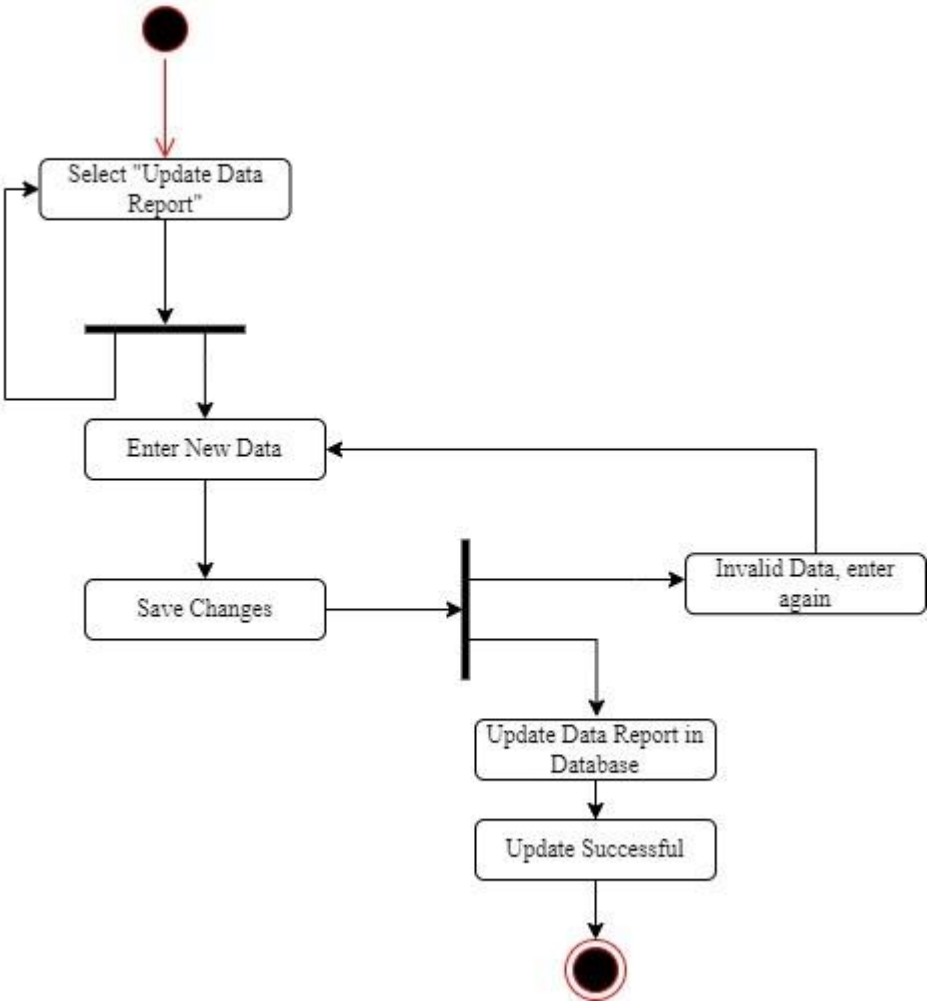


Figure 28: State Diagram- Update Data Report

3.6 Sequence Diagrams

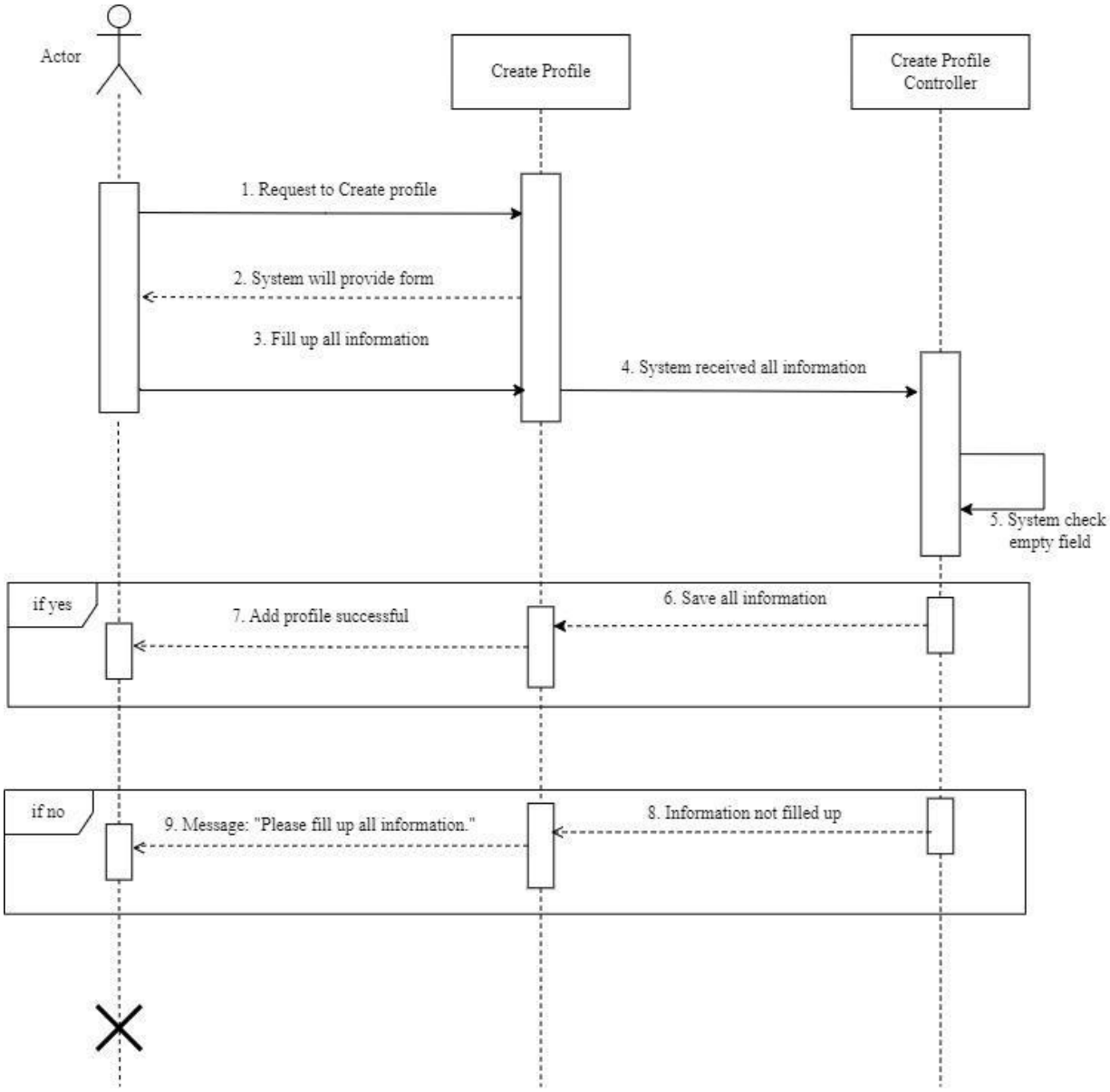


Figure 29: Sequence Diagram- Create Profile

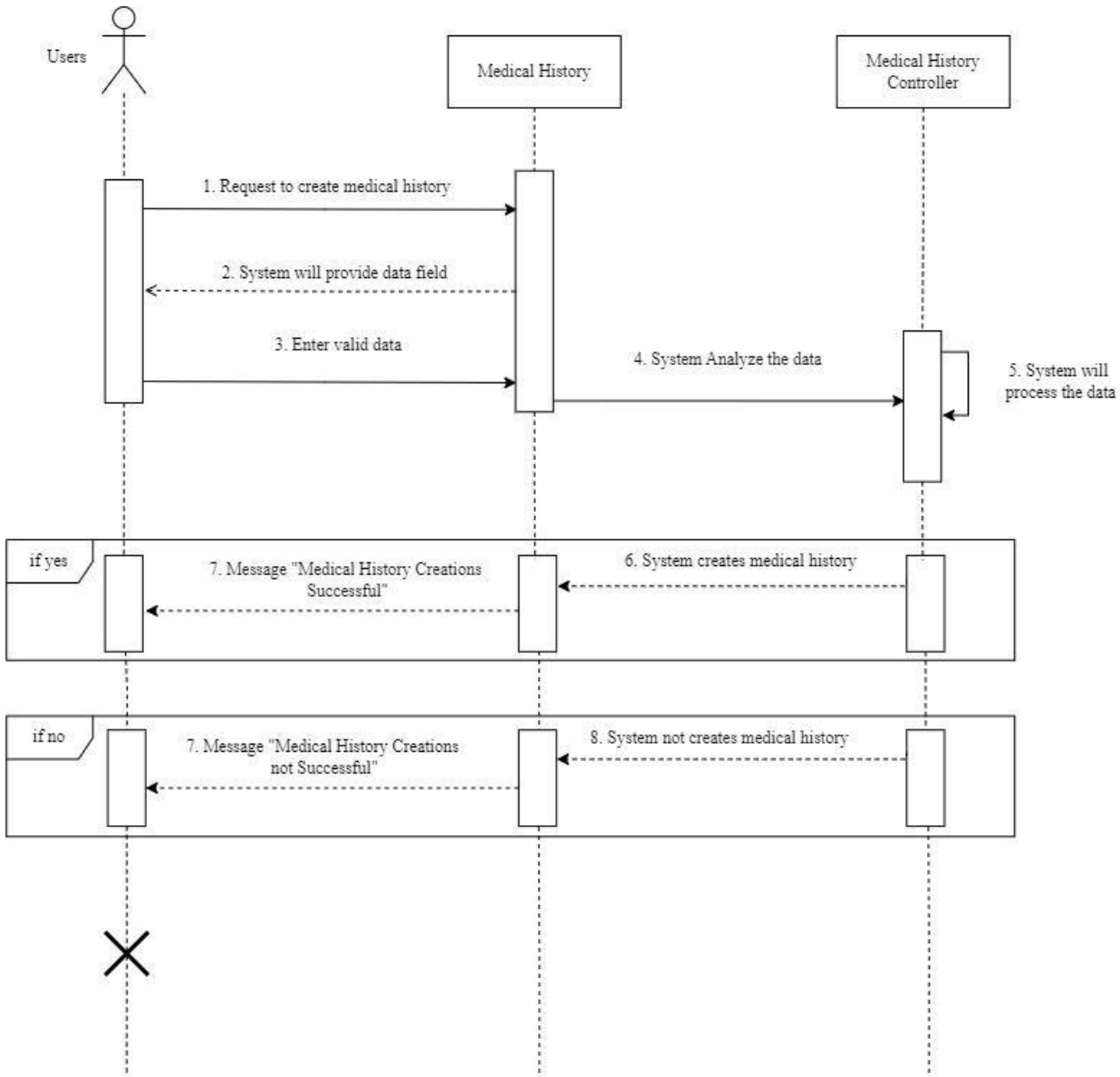


Figure 30: Sequence Diagram- Medial History

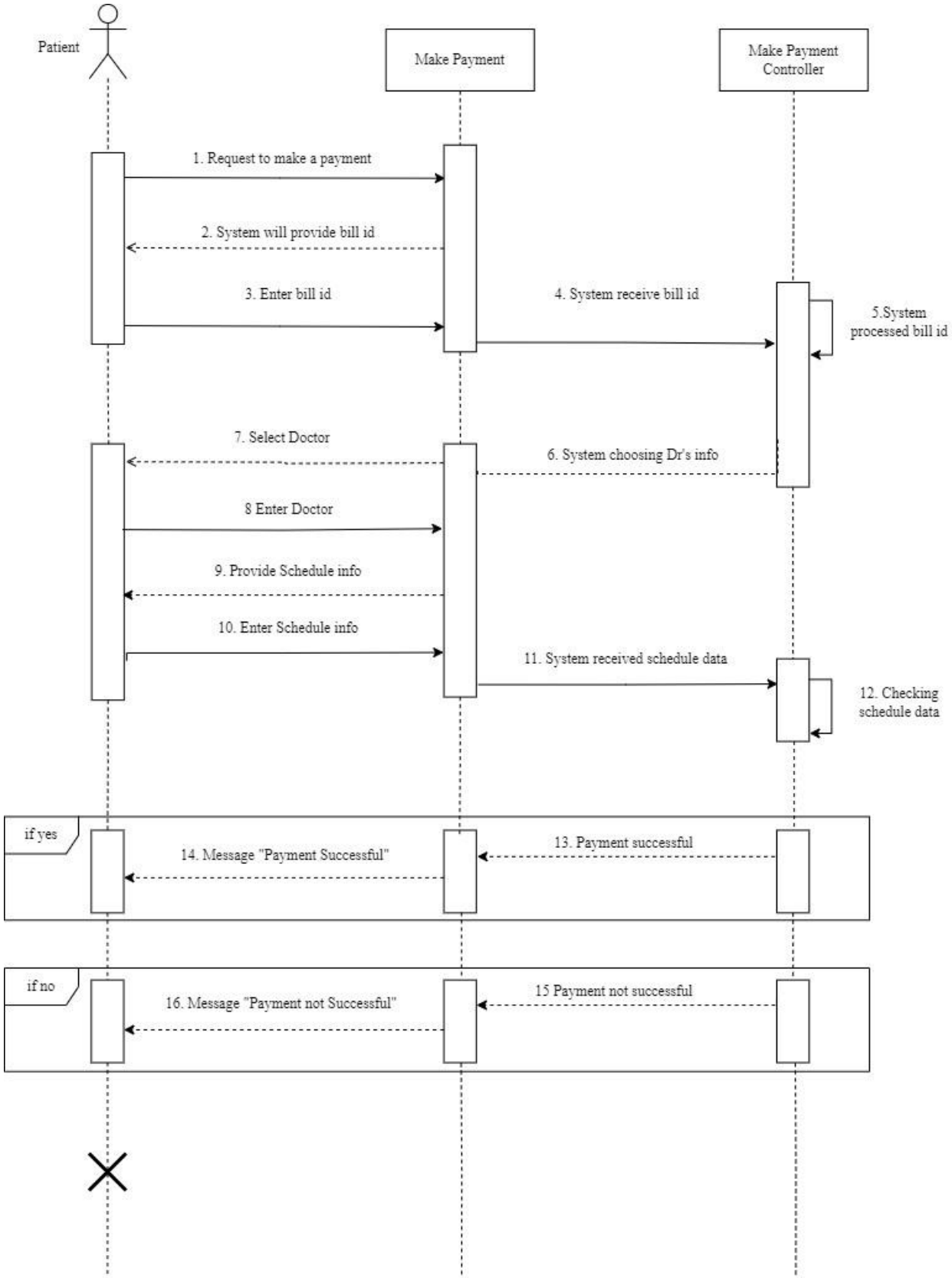


Figure 31: Sequence Diagram- Make Payment

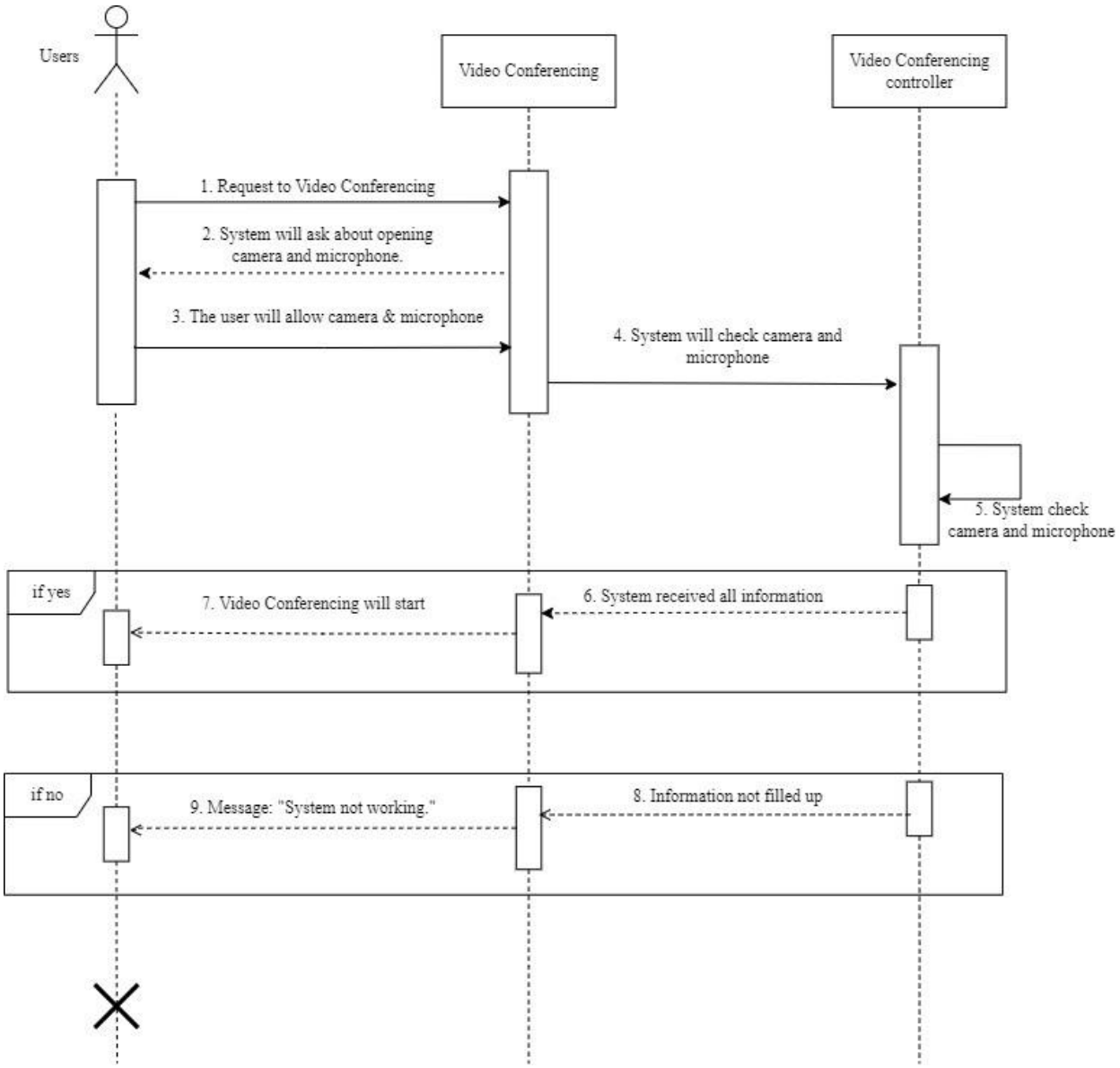


Figure 32: Sequence Diagram- Video Conferencing

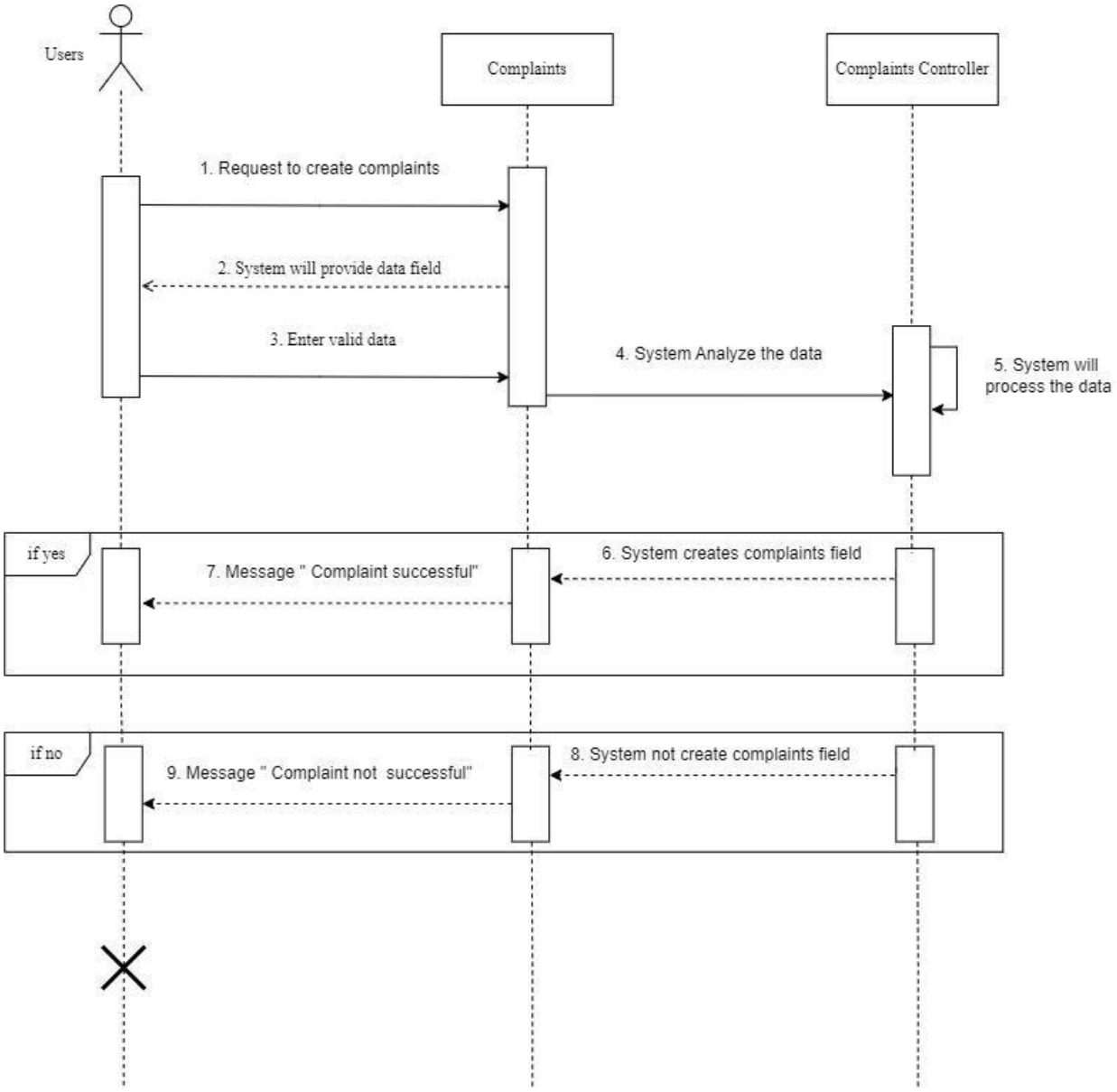


Figure 33: Sequence Diagram- Complaints

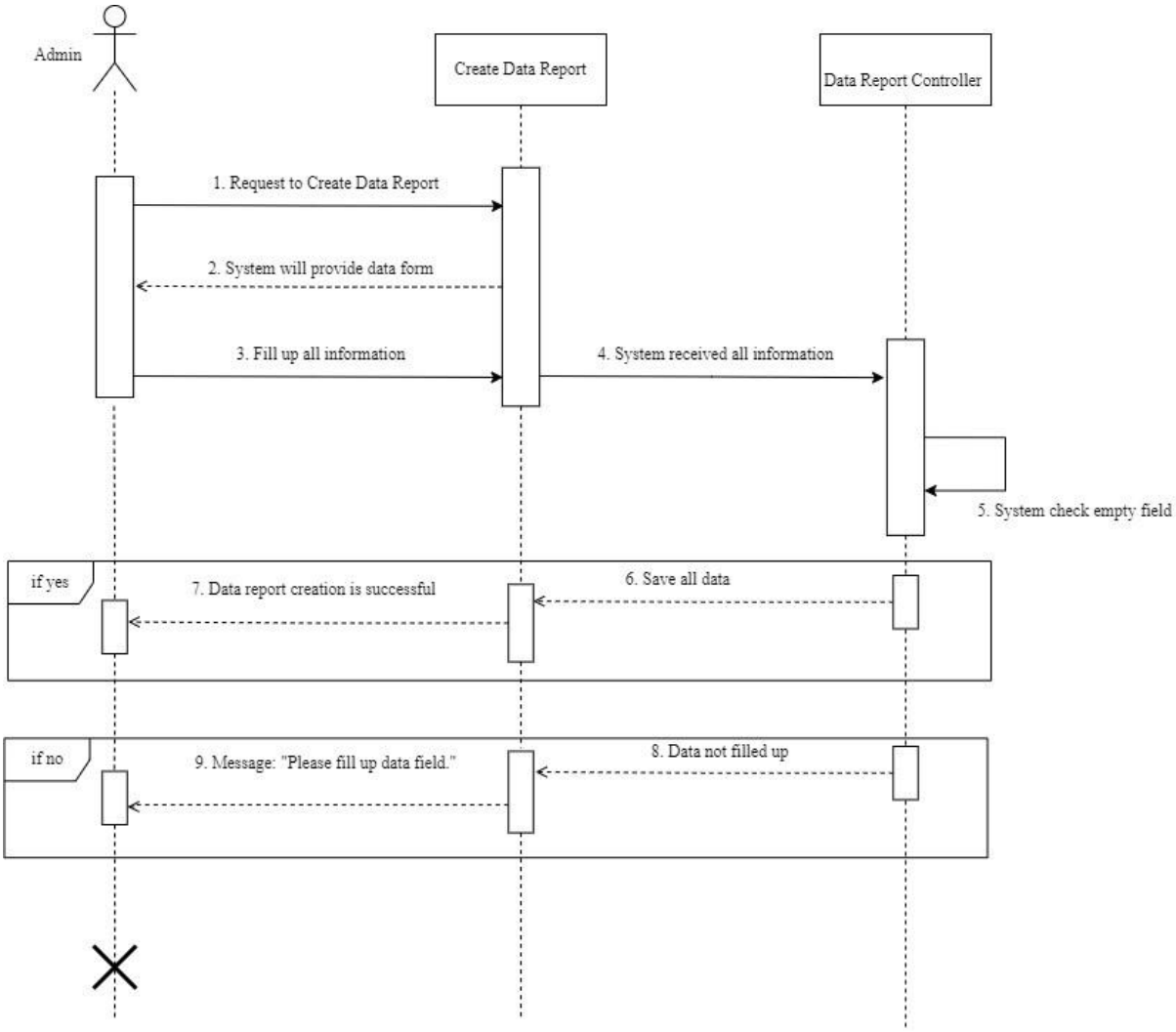


Figure 34: Sequence Diagram- Create Data Report

3.7 Class Diagram

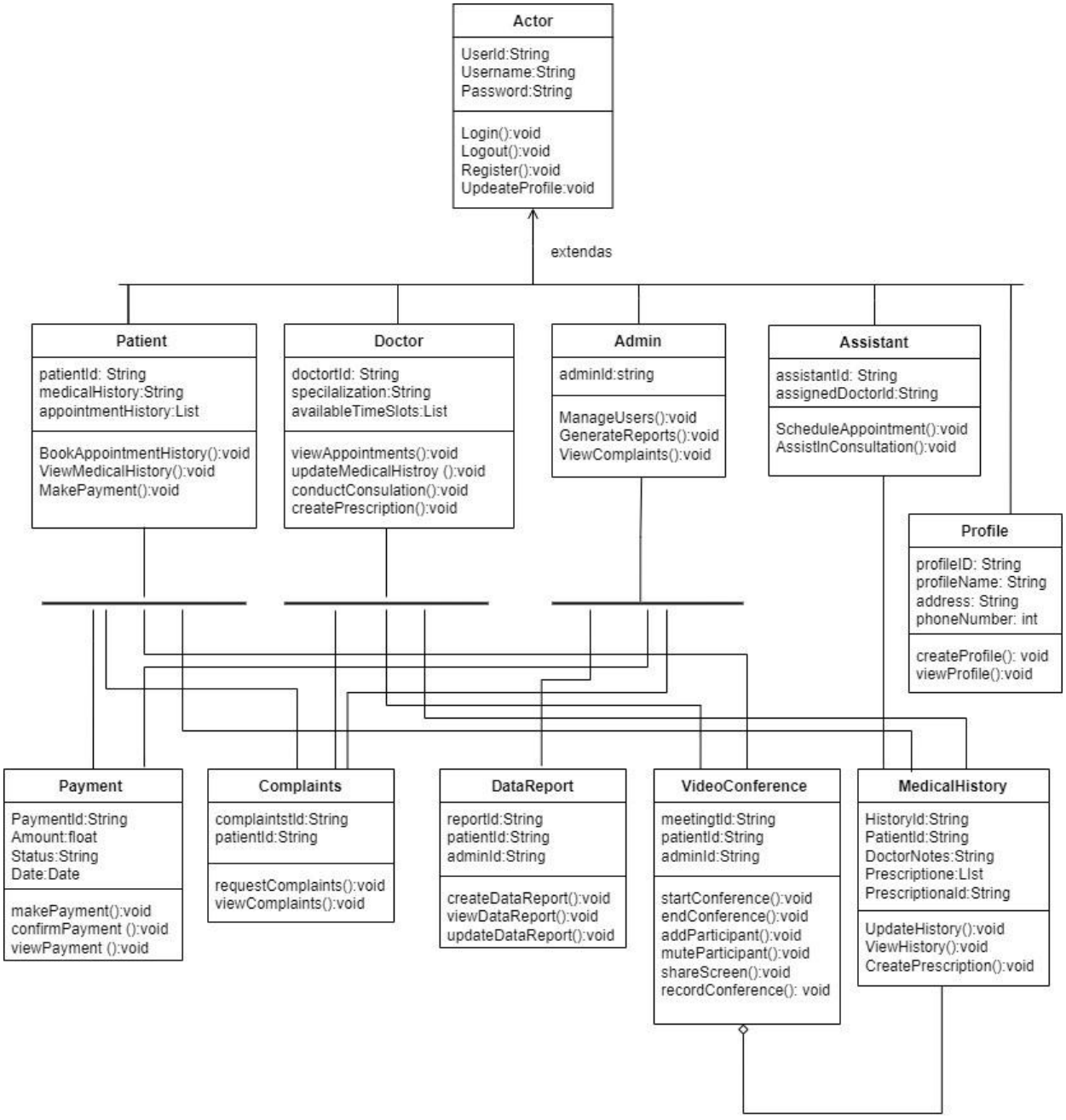


Figure 35: Class Diagram

3.8 Entity Relationship Diagram

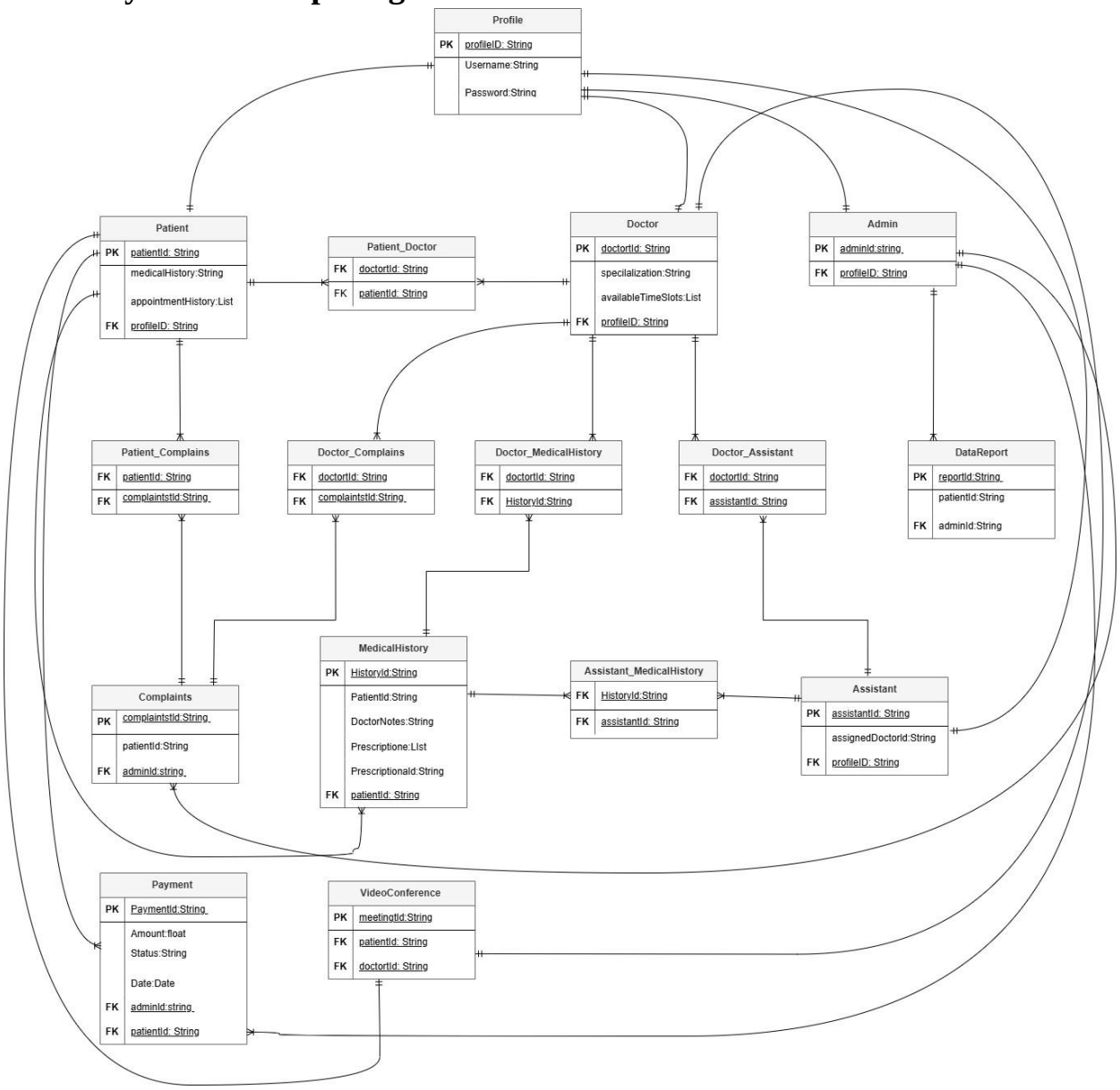
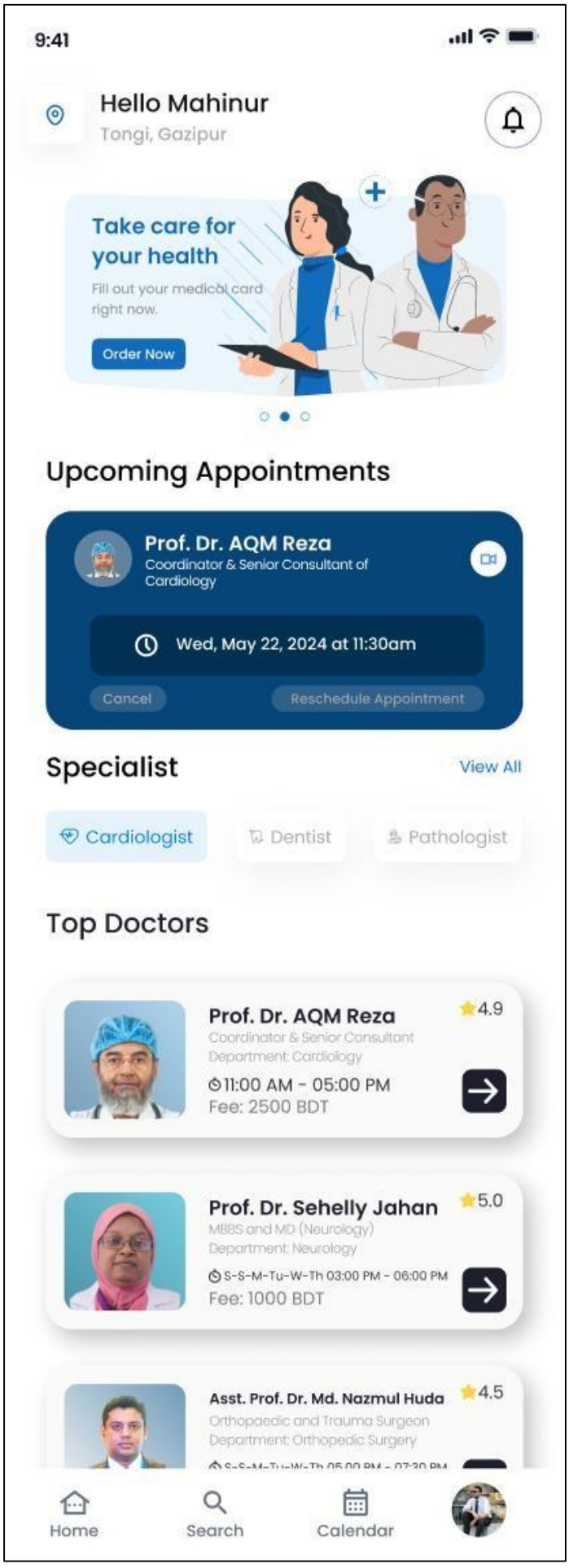


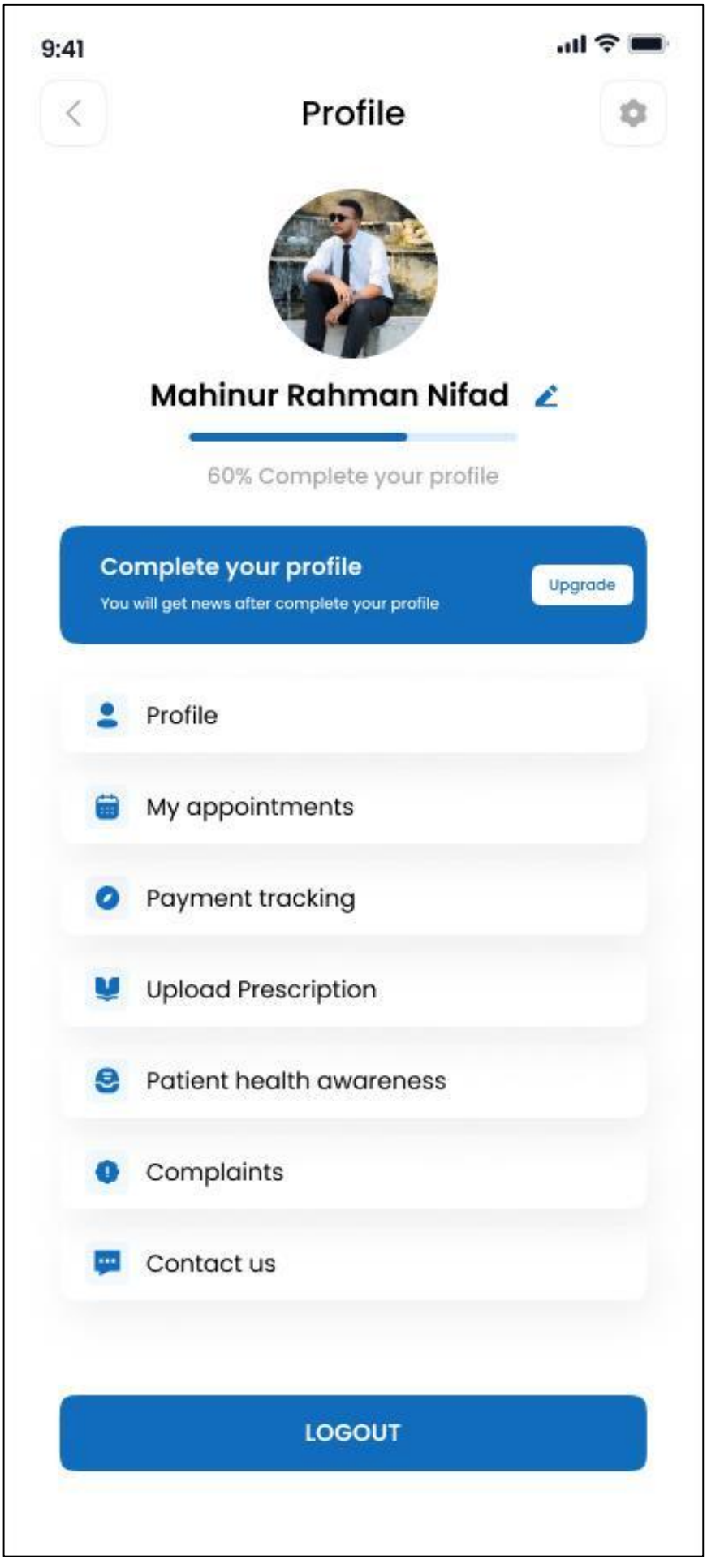
Figure 36: ER Diagram

Chapter 4 Project Prototype

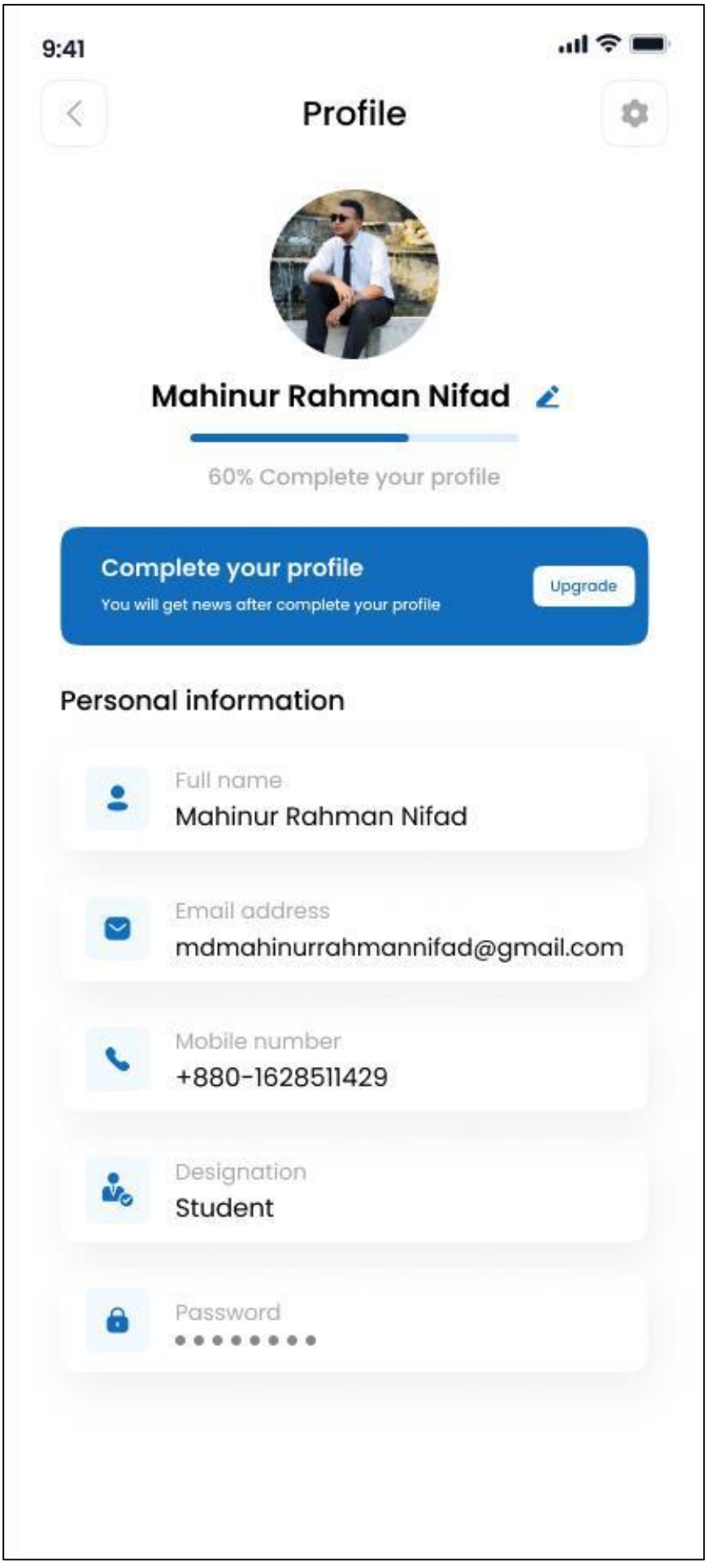
1


9:41
Hello Mahinur
Tongi, Gazipur
Take care for your health
Fill out your medical card right now.
Order Now
Upcoming Appointments
Prof. Dr. AQM Reza
Coordinator & Senior Consultant of Cardiology
Wed, May 22, 2024 at 11:30am
Cancel
Reschedule Appointment
Specialist
View All
Cardiologist
Dentist
Pathologist
Top Doctors
Prof. Dr. AQM Reza
4.9
Coordinator & Senior Consultant
Department: Cardiology
11:00 AM - 05:00 PM
Fee: 2500 BDT
Prof. Dr. Sehelly Jahan
5.0
MBBS and MD (Neurology)
Department: Neurology
S-S-M-Tu-W-Th 03:00 PM - 06:00 PM
Fee: 1000 BDT
Asst. Prof. Dr. Md. Nazmul Huda
4.5
Orthopaedic and Trauma Surgeon
Department: Orthopedic Surgery
Home
Search
Calendar

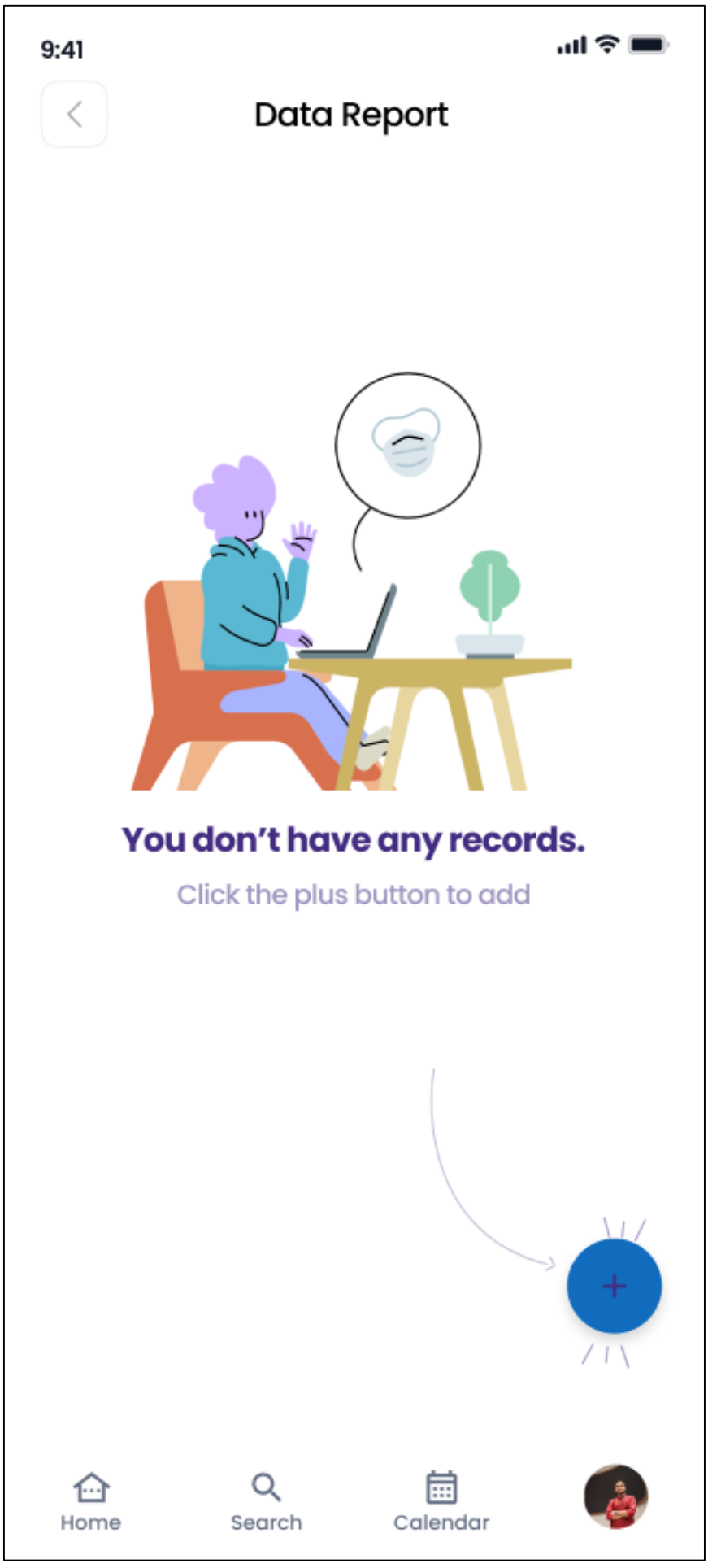
2


9:41
Profile
Mahinur Rahman Nifad
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Profile
My appointments
Payment tracking
Upload Prescription
Patient health awareness
Complaints
Contact us
LOGOUT

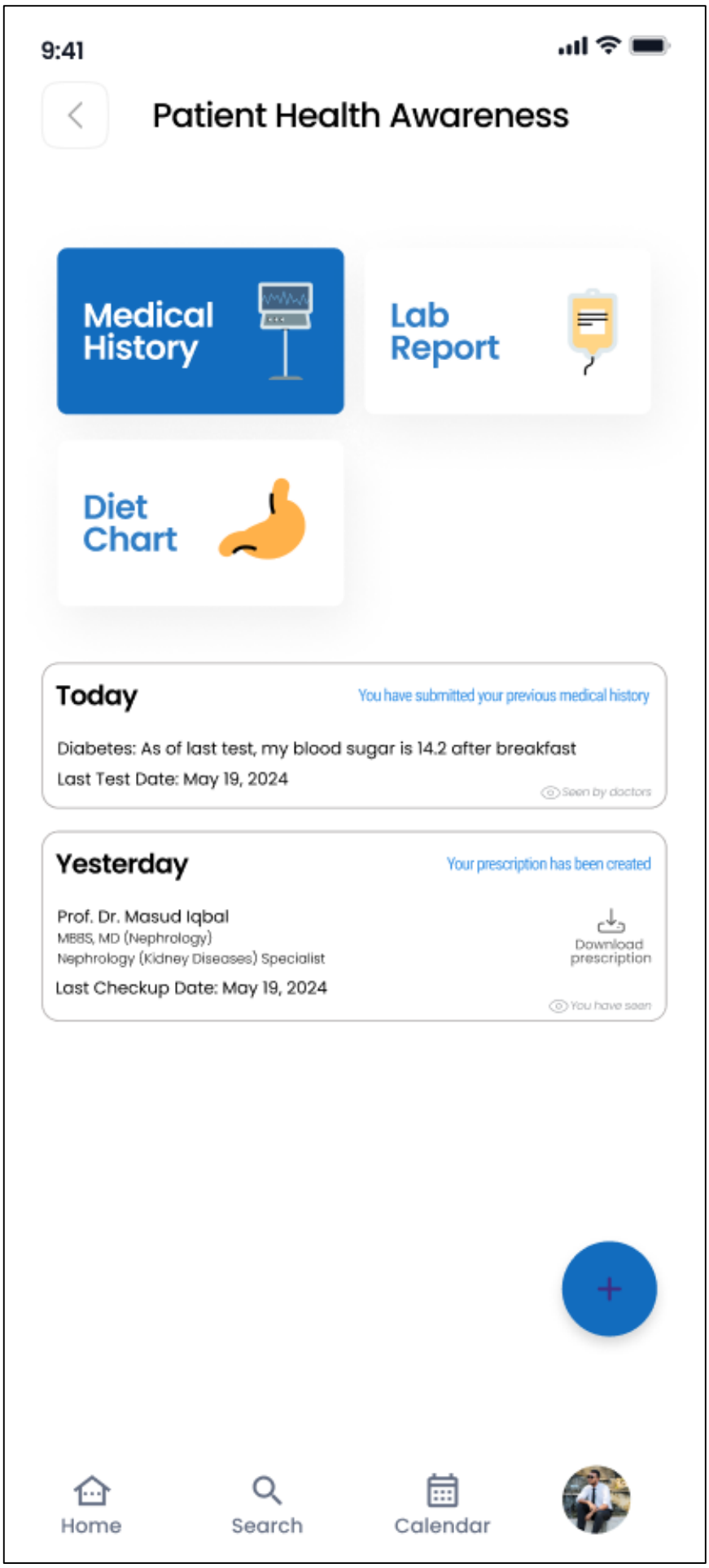
3


9:41
Profile
Mahinur Rahman Nifad
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Personal information
Full name
Mahinur Rahman Nifad
Email address
mdmahinurrahmannifad@gmail.com
Mobile number
+880-1628511429
Designation
Student
Password

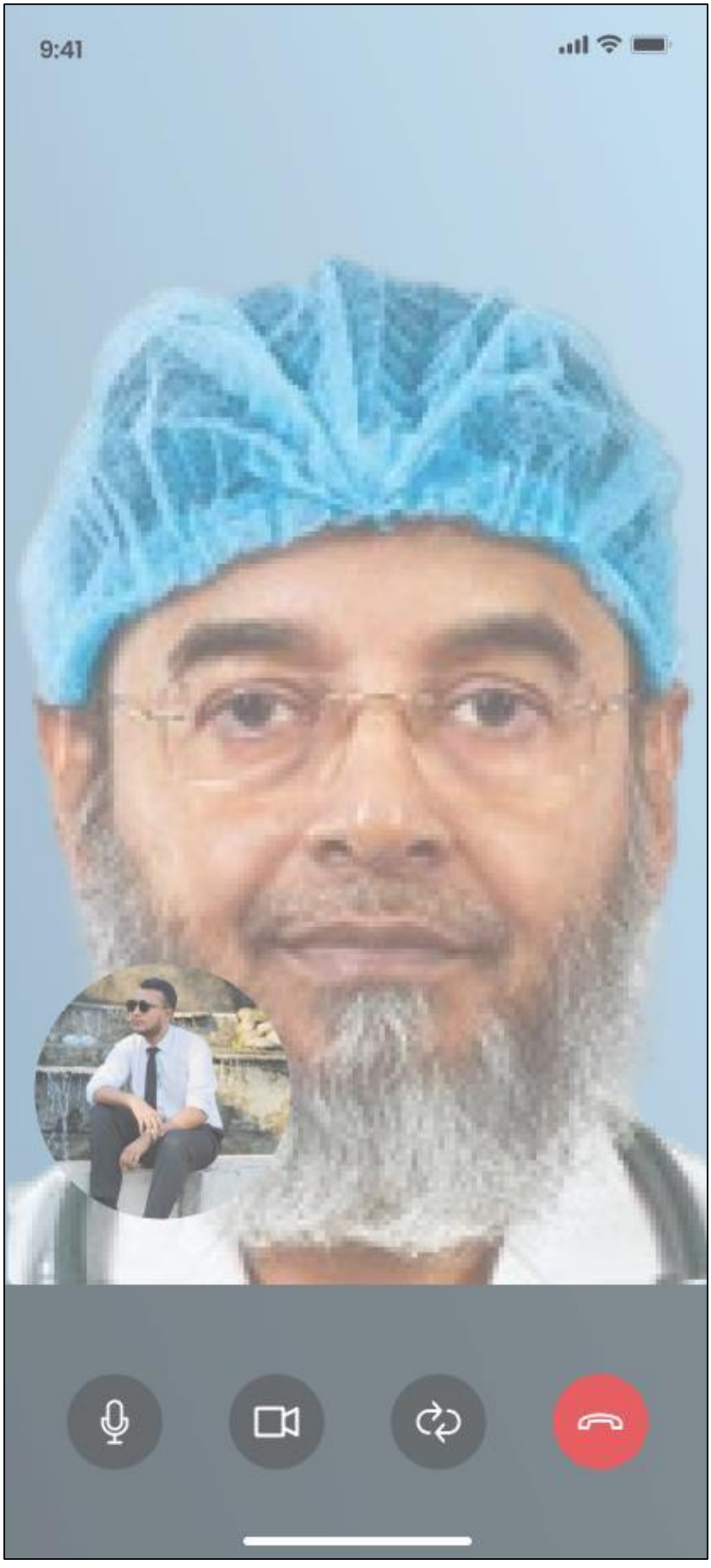
4


9:41
Data Report
You don’t have any records.
Click the plus button to add
Home
Search
Calendar

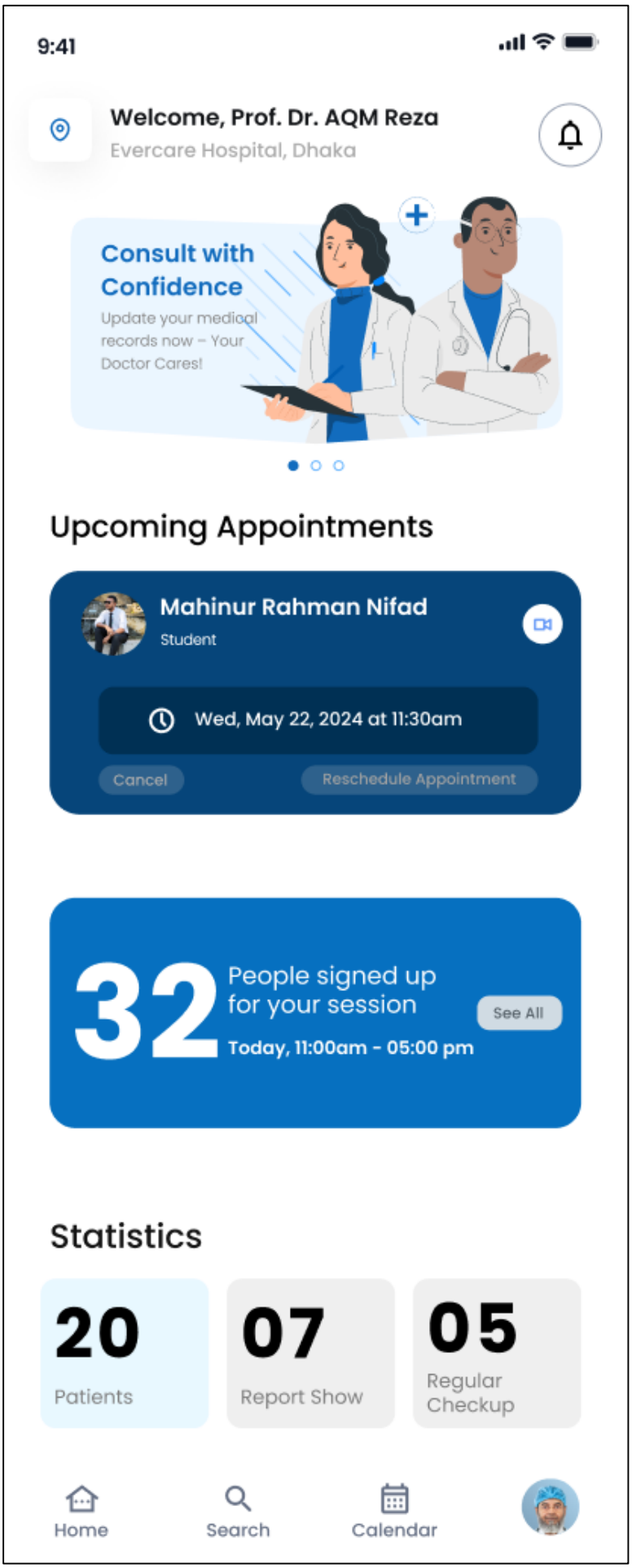
5


9:41
Patient Health Awareness
Medical History
Lab Report
Diet Chart
Today
You have submitted your previous medical history
Diabetes: As of last test, my blood sugar is 14.2 after breakfast
Last Test Date: May 19, 2024
Seen by doctors
Yesterday
Your prescription has been created
Prof. Dr. Masud Iqbal
MBBS, MD (Nephrology)
Nephrology (Kidney Diseases) Specialist
Download prescription
Last Checkup Date: May 19, 2024
You have seen
Home
Search
Calendar

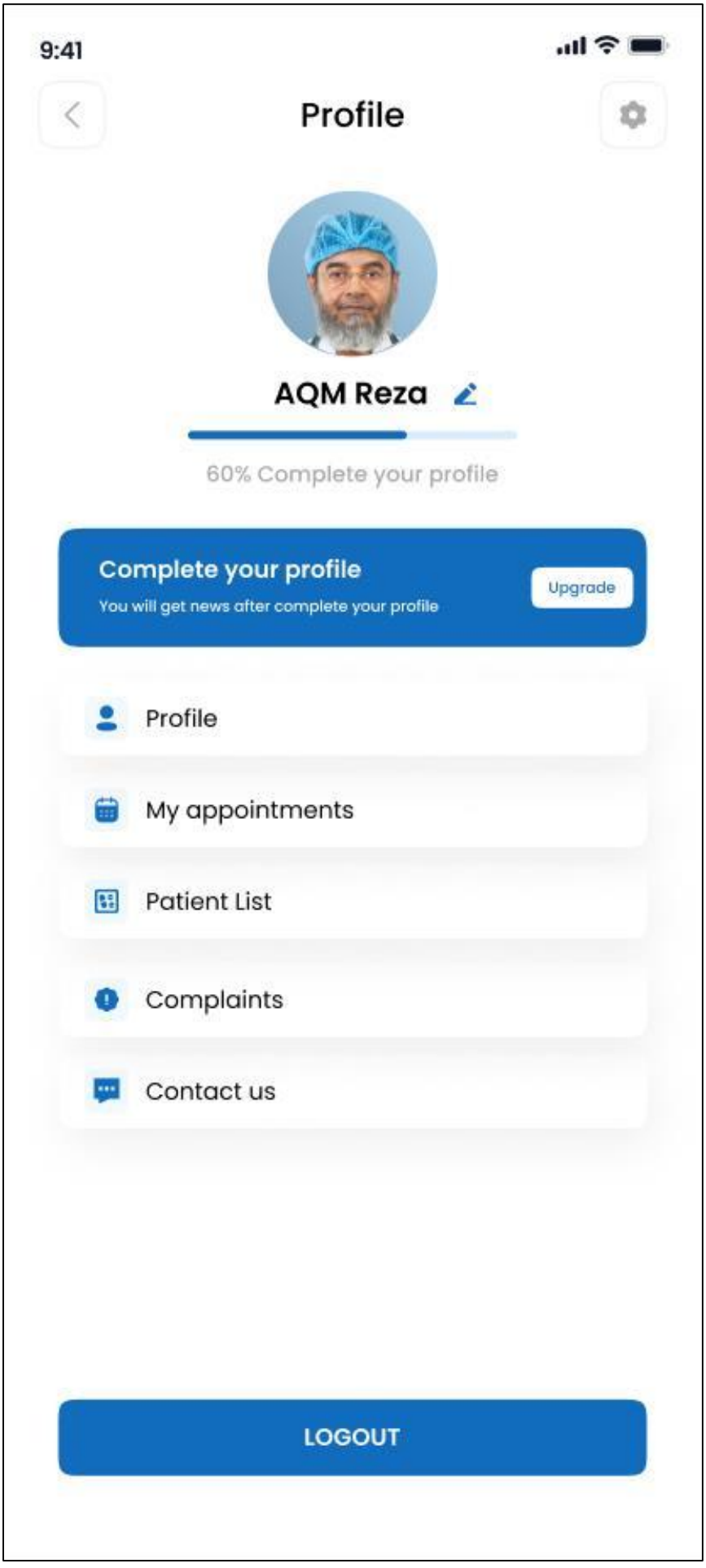
6



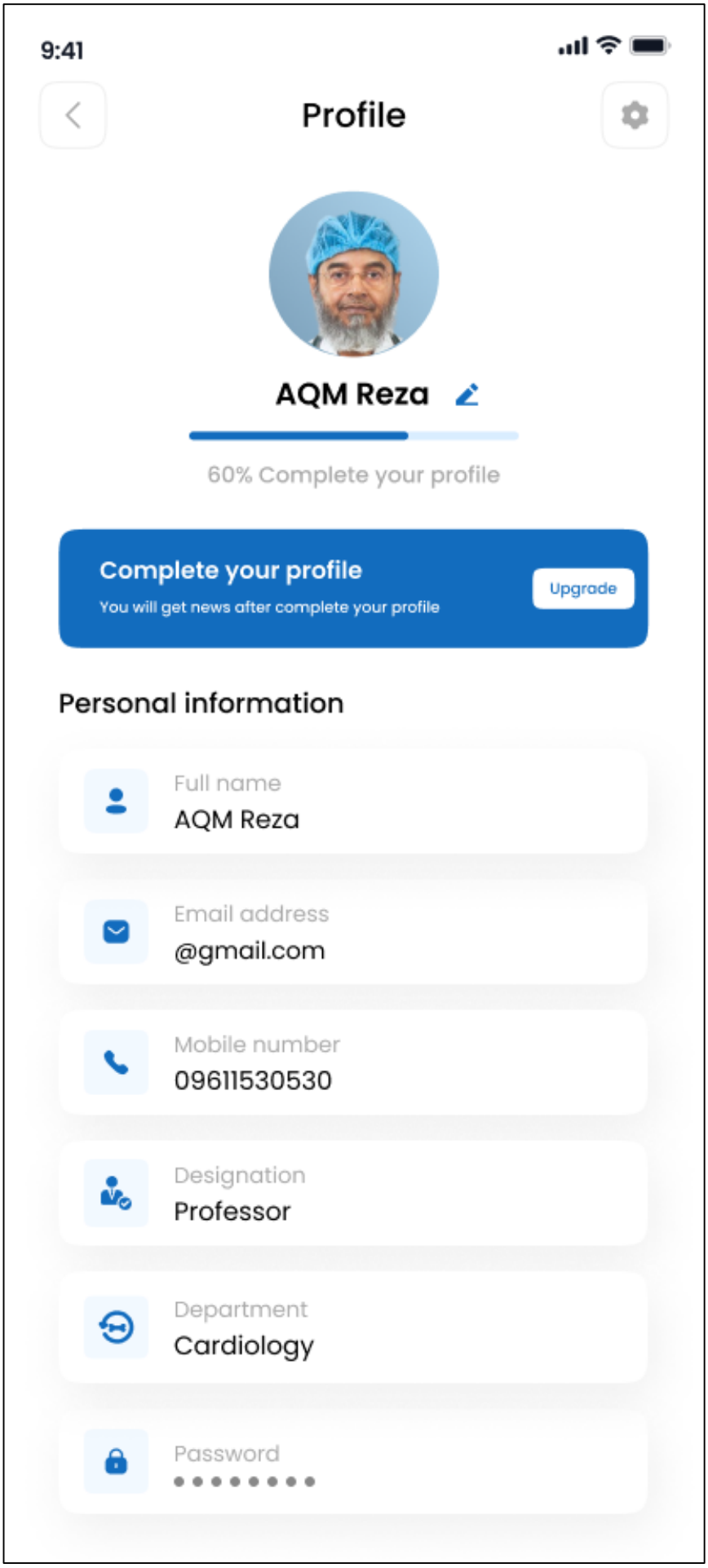
7


9:41
Welcome, Prof. Dr. AQM Reza
Evercare Hospital, Dhaka
Consult with Confidence
Update your medical records now – Your Doctor Cares!
Upcoming Appointments
Mahinur Rahman Nifad
Student
Wed, May 22, 2024 at 11:30am
Cancel
Reschedule Appointment
32
People signed up for your session
Today, 11:00am - 05:00 pm
See All
Statistics
20
Patients
07
Report Show
05
Regular Checkup
Home
Search
Calendar

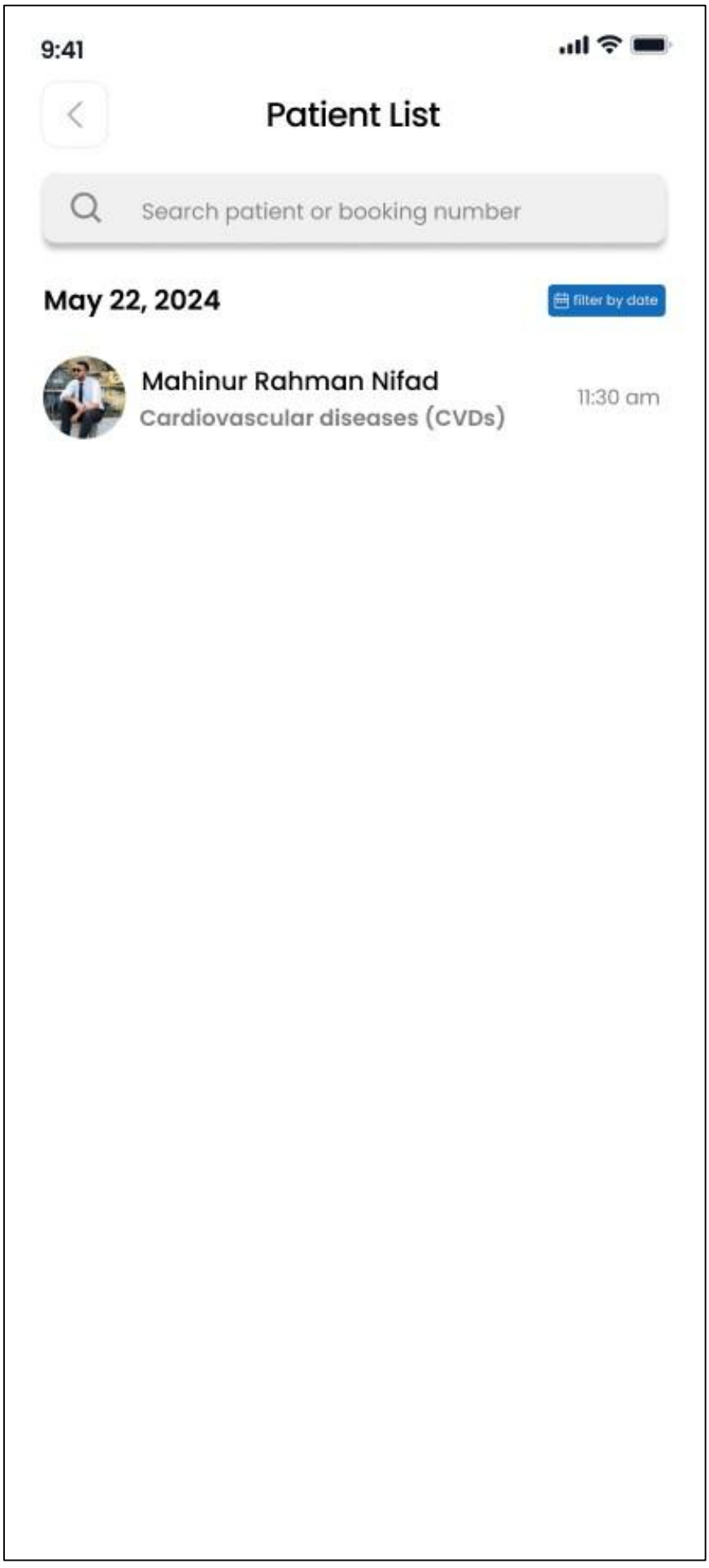
8


9:41
Profile
AQM Reza
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Profile
My appointments
Patient List
Complaints
Contact us
LOGOUT

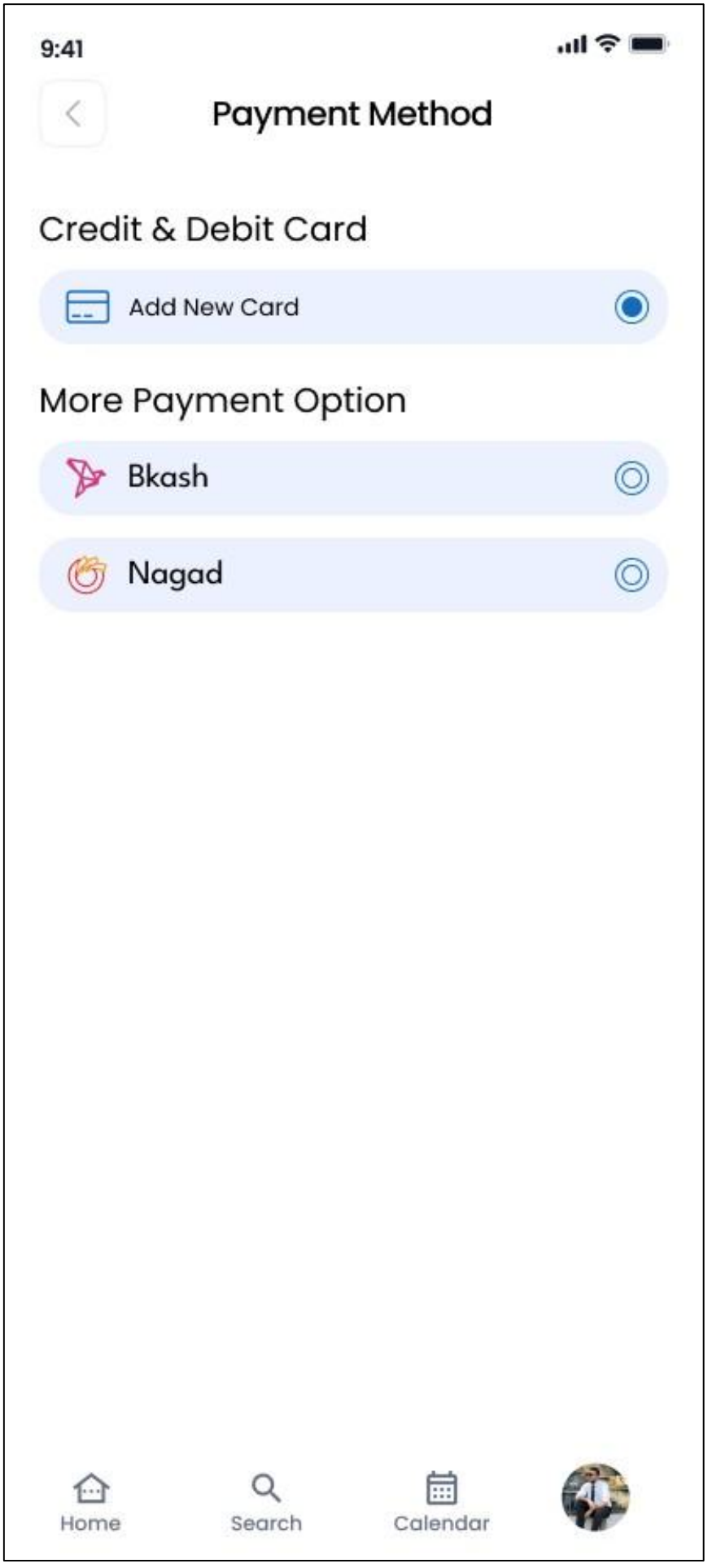
9


9:41
Profile
AQM Reza
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Personal information
Full name
AQM Reza
Email address
@gmail.com
Mobile number
09611530530
Designation
Professor
Department
Cardiology
Password

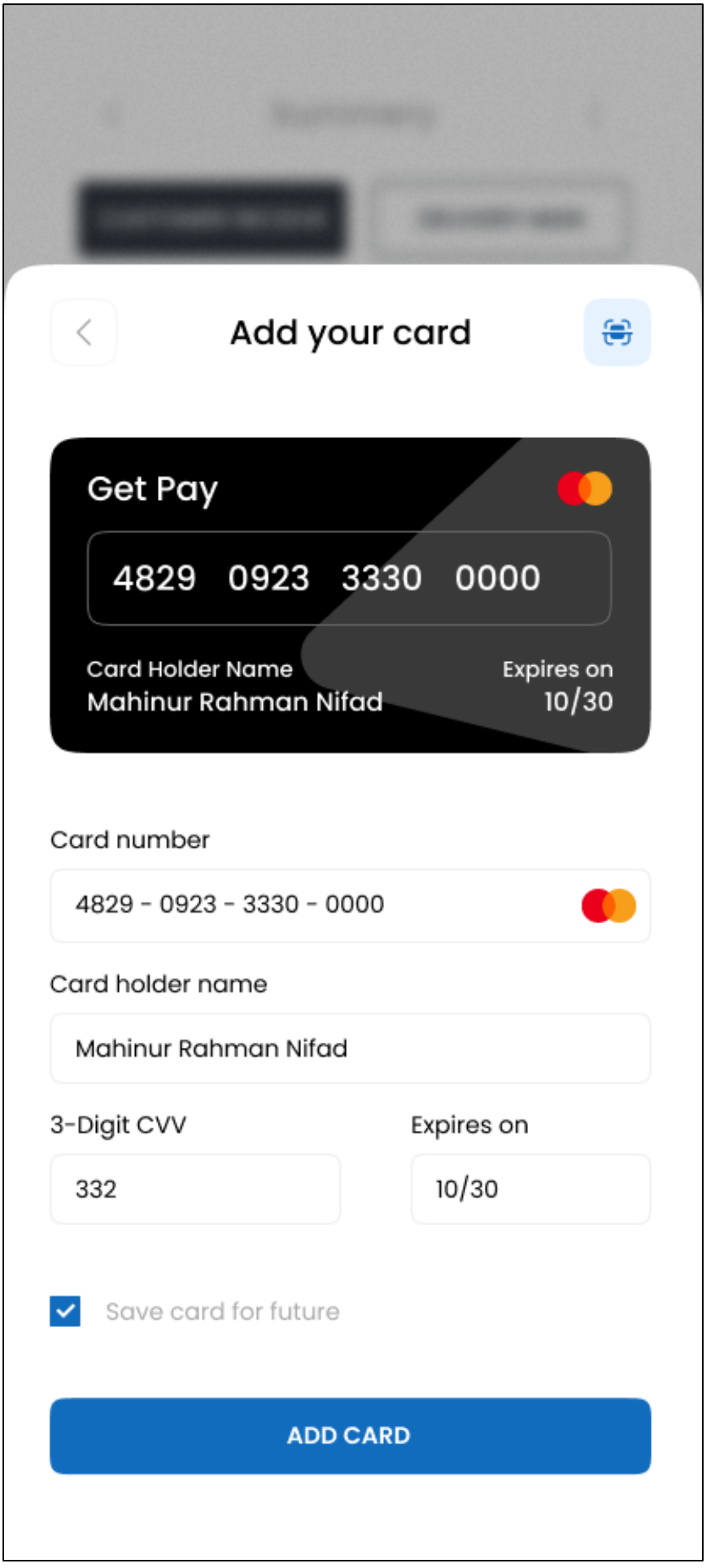
10


9:41
Patient List
Search patient or booking number
May 22, 2024
filter by date
Mahinur Rahman Nifad
Cardiovascular diseases (CVDs)
11:30 am

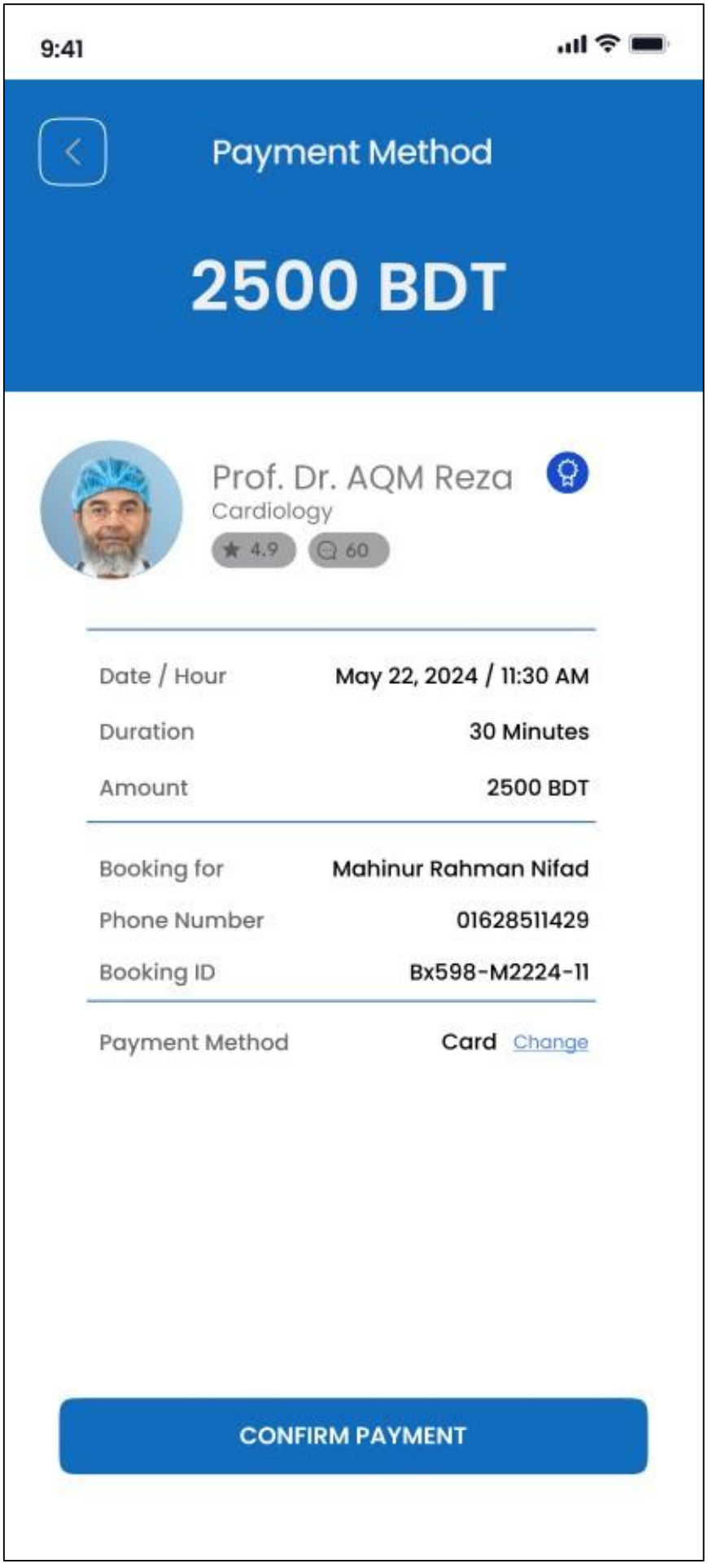
11


9:41
Payment Method
Credit & Debit Card
Add New Card
More Payment Option
Bkash
Nagad
Home
Search
Calendar

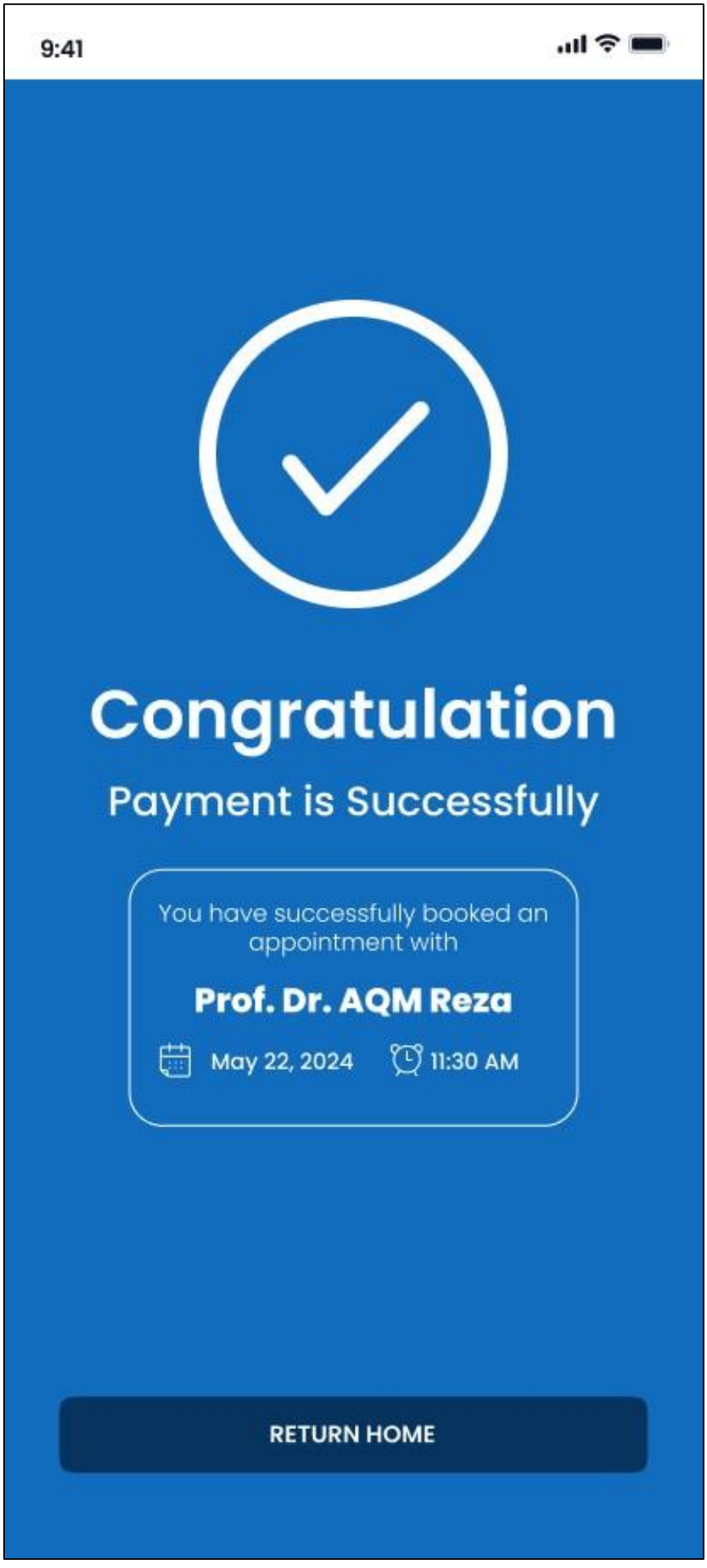
12


Add your card
Get Pay
4829 0923 3330 0000
Card Holder Name
Mahinur Rahman Nifad
Expires on
10/30
Card number
4829 - 0923 - 3330 - 0000
Card holder name
Mahinur Rahman Nifad
3-Digit CVV
332
Expires on
10/30
Save card for future
ADD CARD

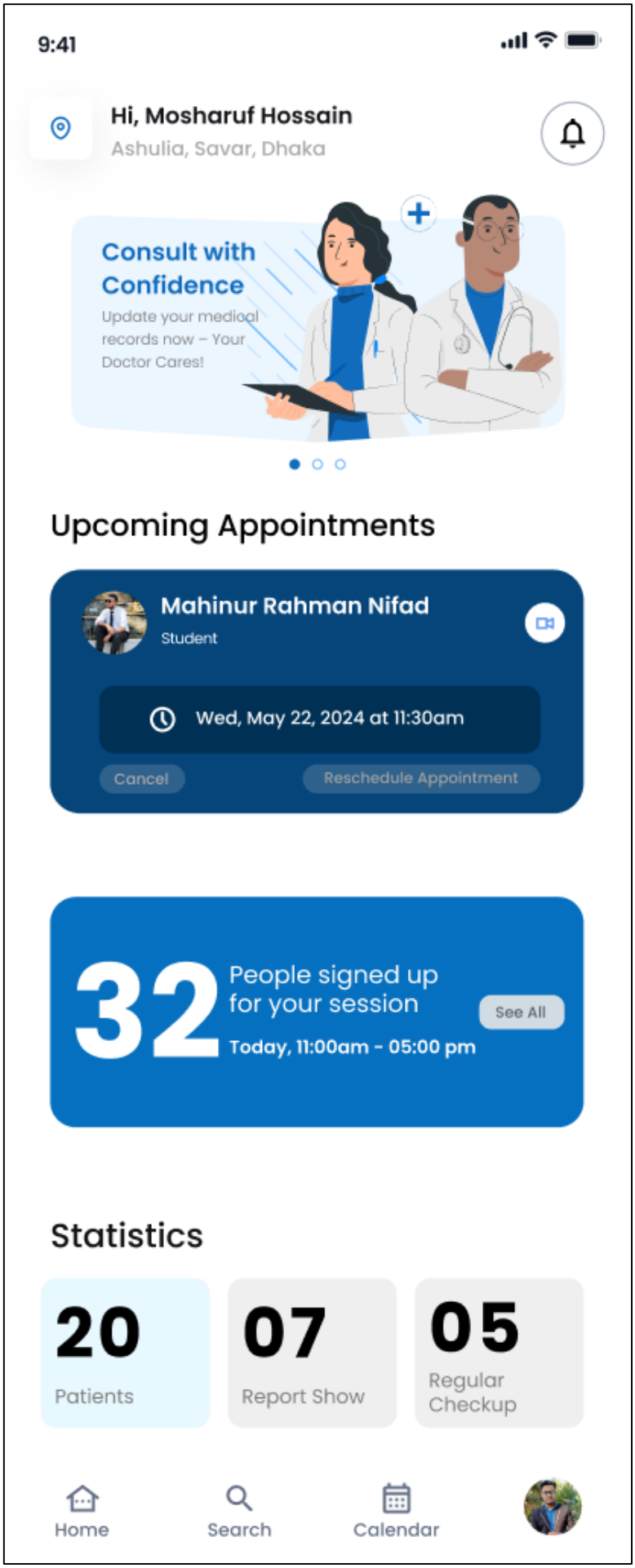
13


9:41
Payment Method
2500 BDT
Prof. Dr. AQM Reza
Cardiology
4.9
60
Date / Hour
May 22, 2024 / 11:30 AM
Duration
30 Minutes
Amount
2500 BDT
Booking for
Mahinur Rahman Nifad
Phone Number
01628511429
Booking ID
Bx598-M2224-11
Payment Method
Card
Change
CONFIRM PAYMENT

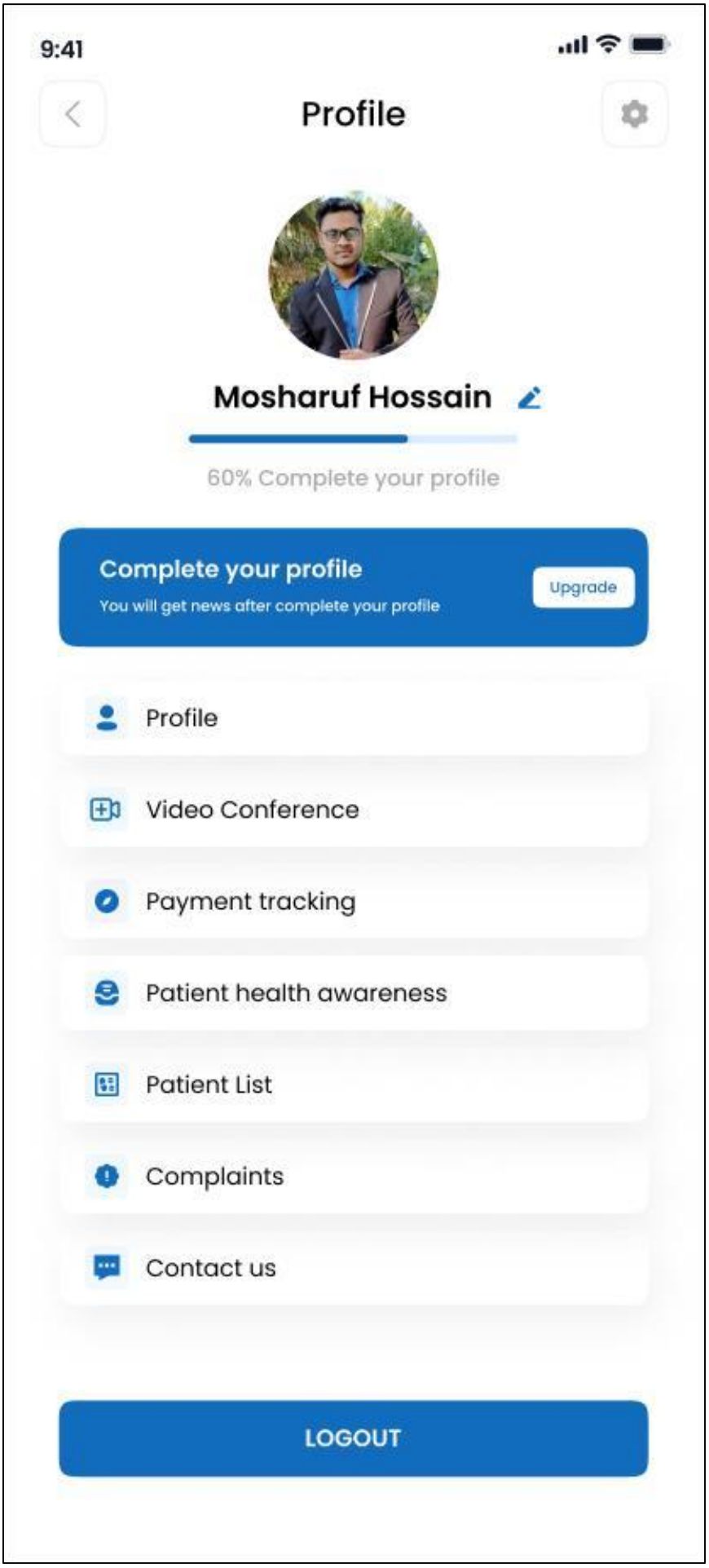
14


9:41
Congratulation
Payment is Successfully
You have successfully booked an appointment with
Prof. Dr. AQM Reza
May 22, 2024
11:30 AM
RETURN HOME

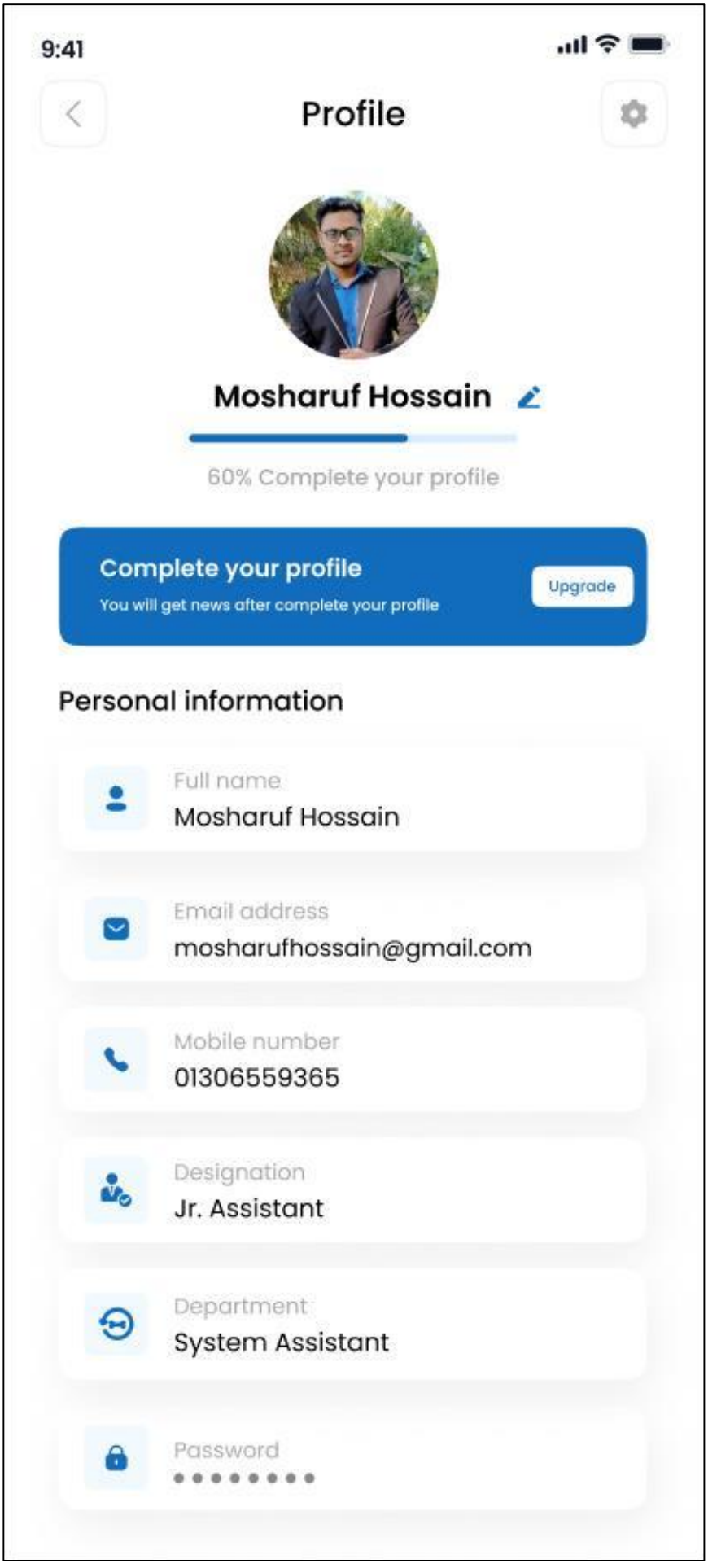
15


9:41
Hi, Mosharuf Hossain
Ashulia, Savar, Dhaka
Consult with Confidence
Update your medical records now – Your Doctor Cares!
Upcoming Appointments
Mahinur Rahman Nifad
Student
Wed, May 22, 2024 at 11:30am
Cancel
Reschedule Appointment
32
People signed up for your session
Today, 11:00am - 05:00 pm
See All
Statistics
20
Patients
07
Report Show
05
Regular Checkup
Home
Search
Calendar

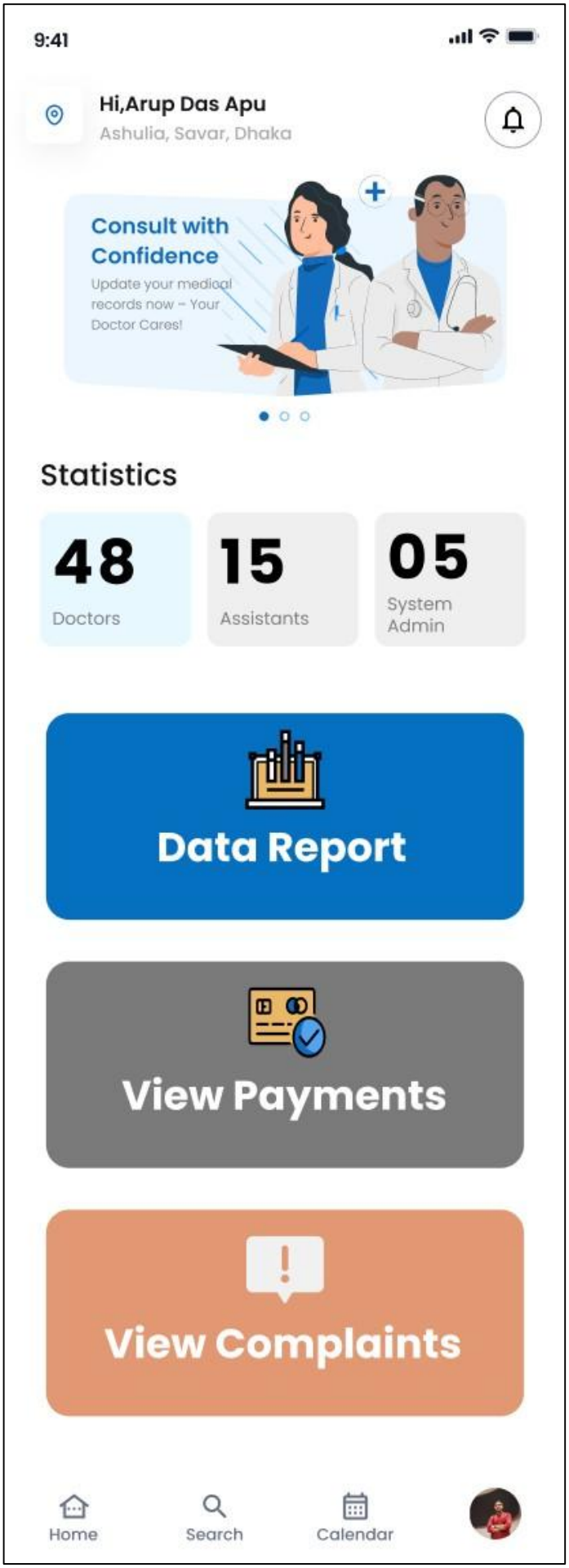
16


9:41
Profile
Mosharuf Hossain
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Profile
Video Conference
Payment tracking
Patient health awareness
Patient List
Complaints
Contact us
LOGOUT

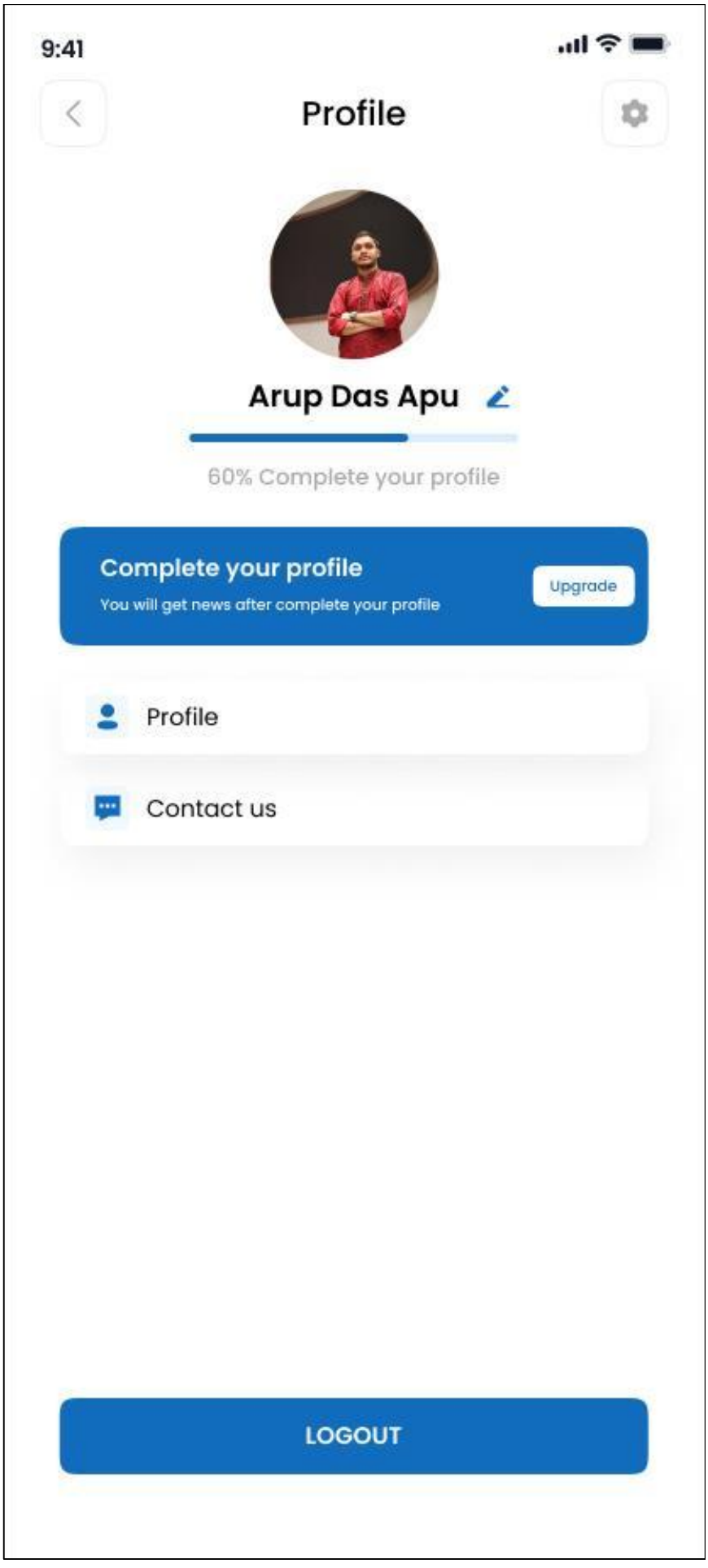
17


9:41
Profile
Mosharuf Hossain
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Personal information
Full name
Mosharuf Hossain
Email address
mosharufhossain@gmail.com
Mobile number
01306559365
Designation
Jr. Assistant
Department
System Assistant
Password

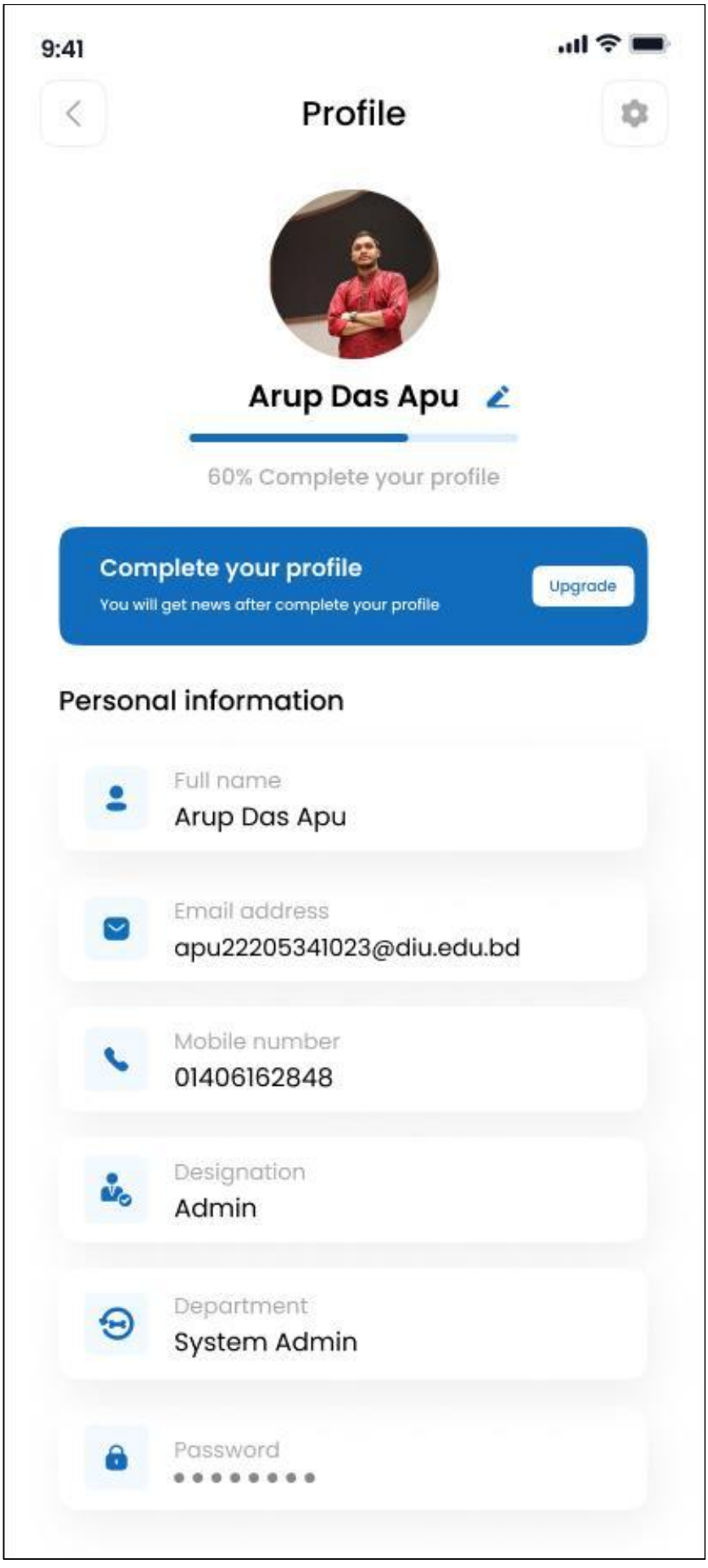
18


9:41
Hi,Arup Das Apu
Ashulia, Savar, Dhaka
Consult with Confidence
Update your medical records now – Your Doctor Cares!
Statistics
48
Doctors
15
Assistants
05
System Admin
Data Report
View Payments
View Complaints
Home
Search
Calendar

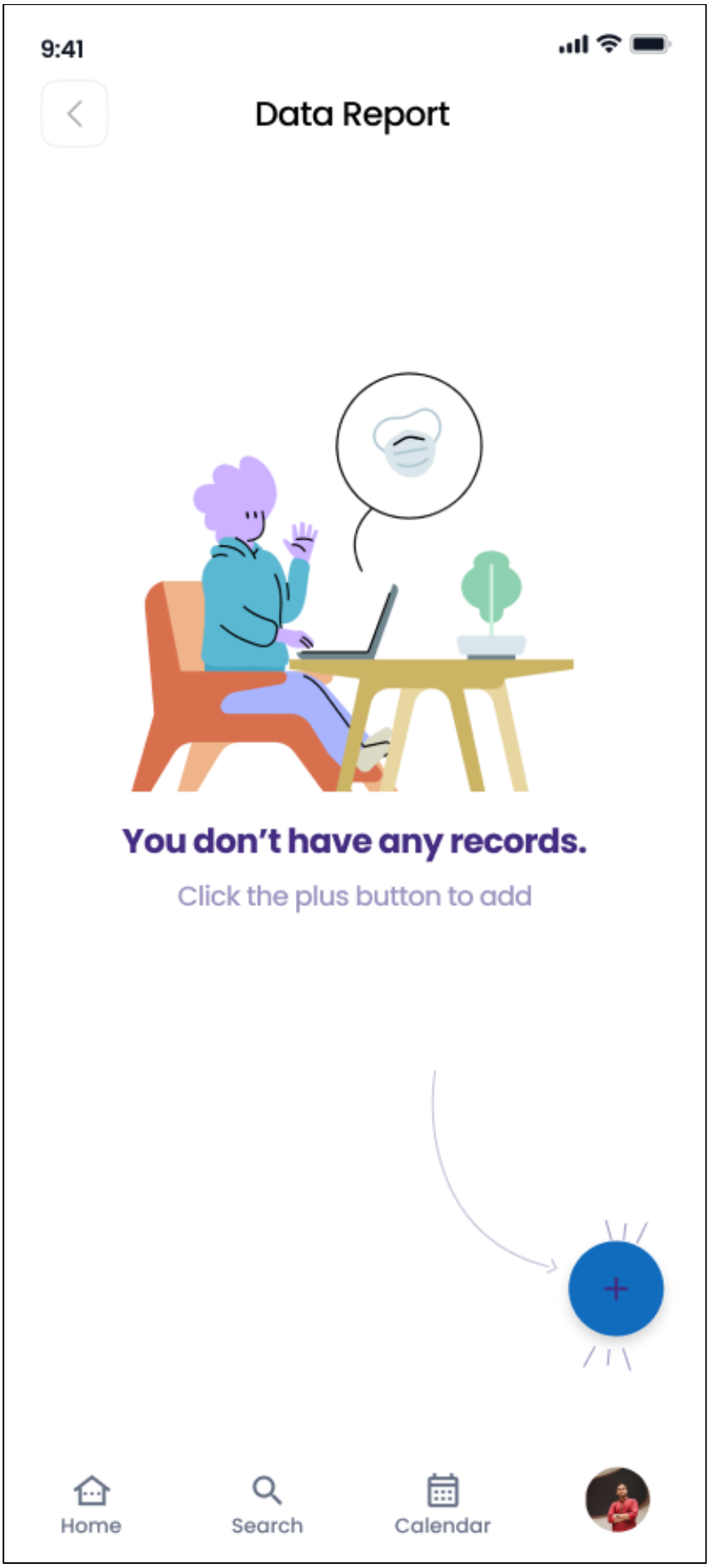
19


9:41
Profile
Arup Das Apu
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Profile
Contact us
LOGOUT

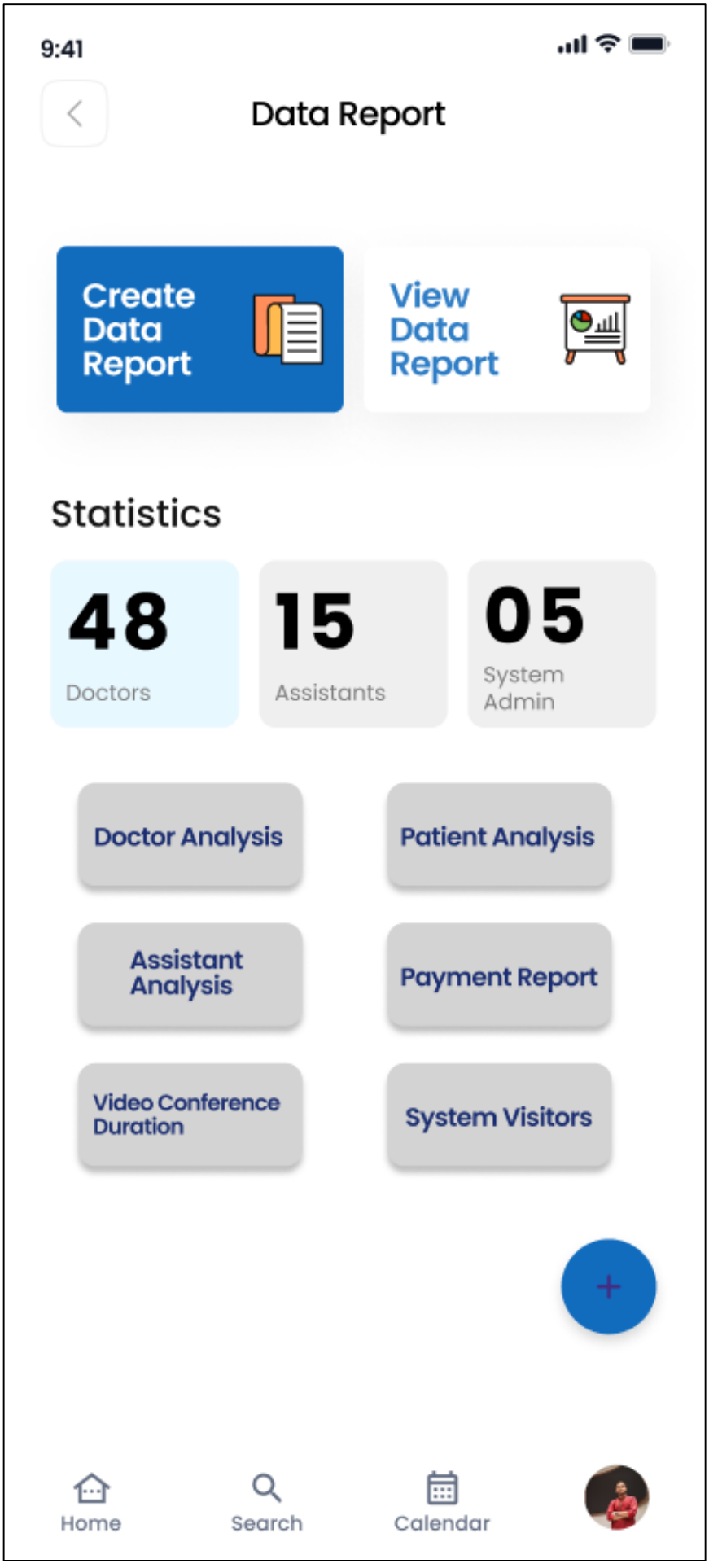
20


9:41
Profile
Arup Das Apu
60% Complete your profile
Complete your profile
You will get news after complete your profile
Upgrade
Personal information
Full name
Arup Das Apu
Email address
apu22205341023@diu.edu.bd
Mobile number
01406162848
Designation
Admin
Department
System Admin
Password

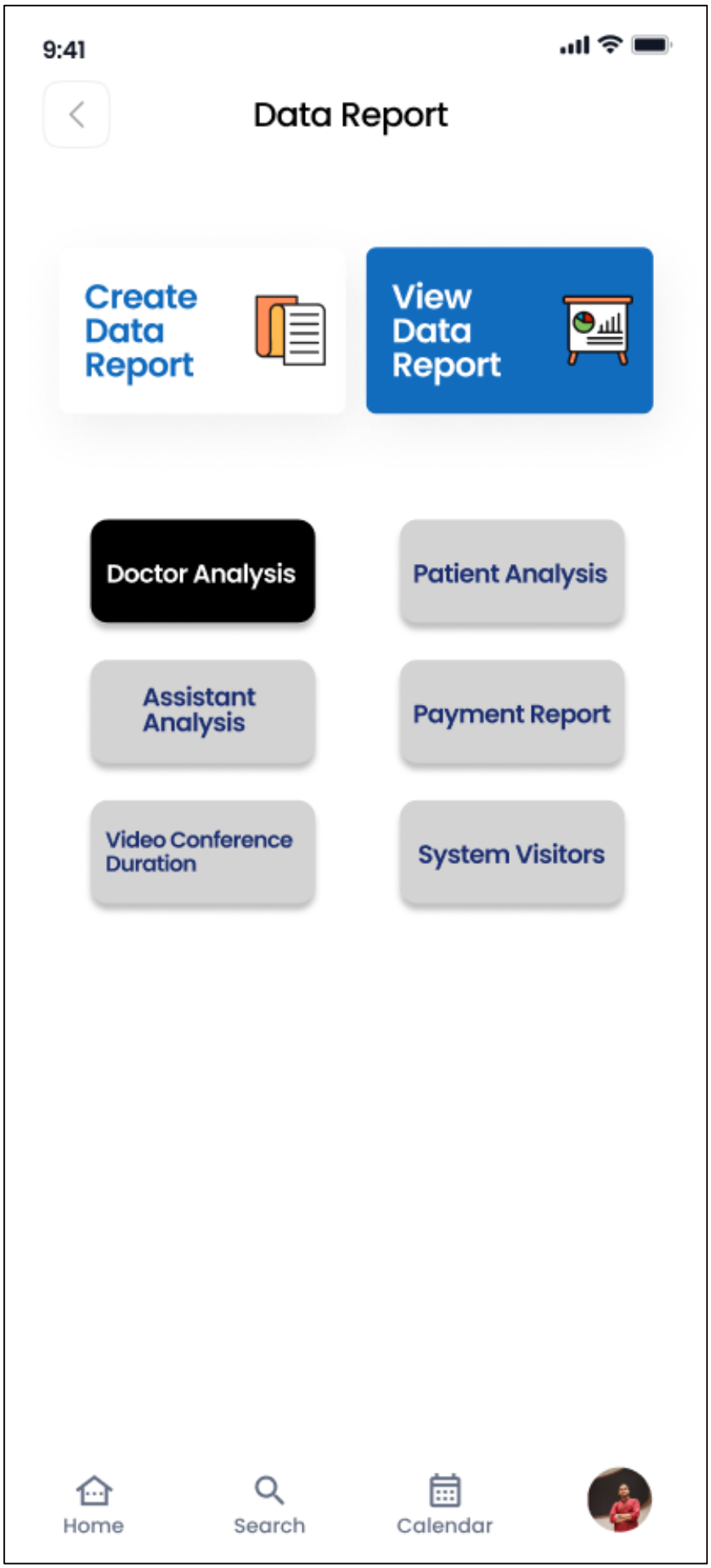
21


9:41
Data Report
You don't have any records.
Click the plus button to add
Home
Search
Calendar

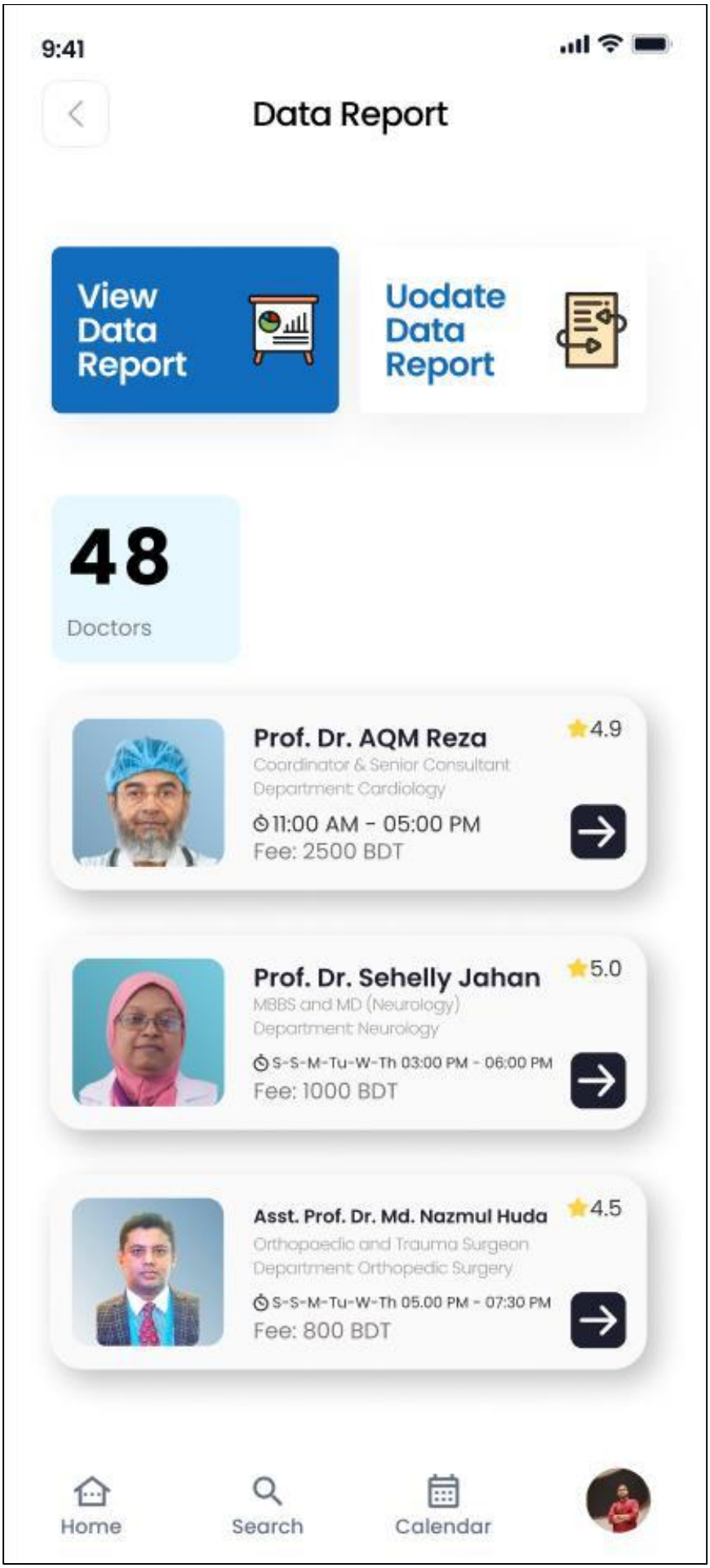
22


9:41
Data Report
Create Data Report
View Data Report
Statistics
48
Doctors
15
Assistants
05
System Admin
Doctor Analysis
Patient Analysis
Assistant Analysis
Payment Report
Video Conference Duration
System Visitors
Home
Search
Calendar

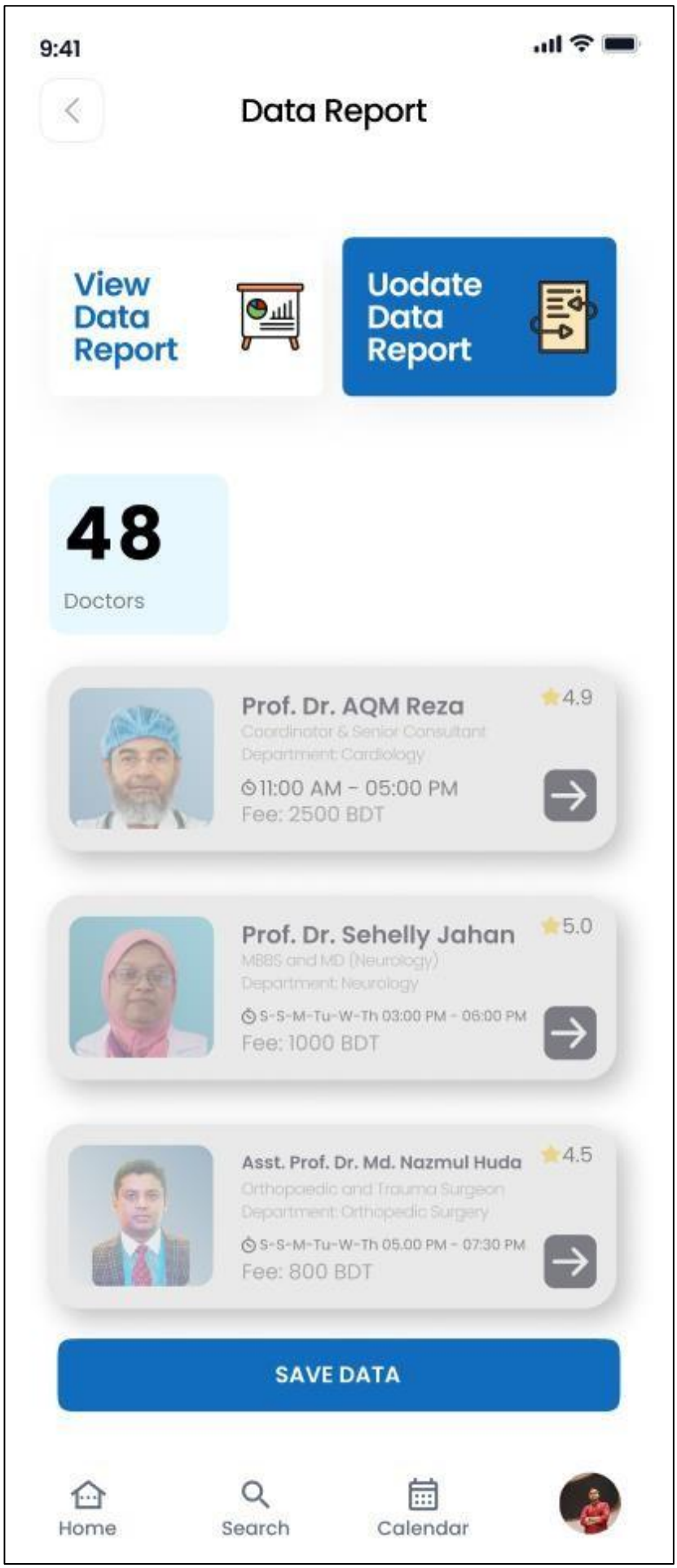
23


9:41
Data Report
Create Data Report
View Data Report
Doctor Analysis
Patient Analysis
Assistant Analysis
Payment Report
Video Conference Duration
System Visitors
Home
Search
Calendar

24


9:41
Data Report
View Data Report
Uodate Data Report
48
Doctors
Prof. Dr. AQM Reza
Coordinator & Senior Consultant
Department: Cardiology
11:00 AM - 05:00 PM
Fee: 2500 BDT
4.9
Prof. Dr. Sehelly Jahan
MBBS and MD (Neurology)
Department: Neurology
S-S-M-Tu-W-Th 03:00 PM - 06:00 PM
Fee: 1000 BDT
5.0
Asst. Prof. Dr. Md. Nazmul Huda
Orthopaedic and Trauma Surgeon
Department: Orthopedic Surgery
S-S-M-Tu-W-Th 05.00 PM - 07:30 PM
Fee: 800 BDT
4.5
Home
Search
Calendar

25


9:41
Data Report
View Data Report
Uodate Data Report
48
Doctors
Prof. Dr. AQM Reza
4.9
Coordinator & Senior Consultant
Department: Cardiology
11:00 AM - 05:00 PM
Fee: 2500 BDT
Prof. Dr. Sehelly Jahan
5.0
MBBS and MD (Neurology)
Department: Neurology
S-S-M-Tu-W-Th 03:00 PM - 06:00 PM
Fee: 1000 BDT
Asst. Prof. Dr. Md. Nazmul Huda
4.5
Orthopaedic and Trauma Surgeon
Department: Orthopedic Surgery
S-S-M-Tu-W-Th 05.00 PM - 07:30 PM
Fee: 800 BDT
SAVE DATA
Home
Search
Calendar